# Report of the Inspection of Mines in India for the years 1894-1896

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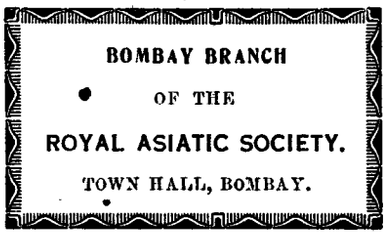


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# REPORT

OF THE

# INSPECTION OF MINES IN INDIA,

FOR THE

YEAR ENDING THE 30TH JUNE

1894. – 1896

134442

JAMES GRUNDY, Esq.,
INSPECTOR OF MINES IN INDIA.

00134442

CALCUTTA:
OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.
1894.

Starting on tour.

5. I started on tour to inspect the coal mines of Bengal on Thursday the 18th of January; a stranger amongst strangers, and in what appeared to be a very strange land: without an Indian Mines Act to define what should and should not be done in the working of mines, and without legislative powers; depending largely on the good will of mine owners and their representatives.

Preparations for tour.

The way had been to some extent cleared and prepared for me by communications from the Director of the Geological Survey of India, and the "District officials;" also, personally, by C. A. Walsh, Esq., special Inspector of Factories, Bengal, who was selected to be the "Provincial Officer" to make arrangements for my tour; and also by myself by a personal interview with the Agents of each of the firms who have an office in Calcutta.

Personal establishment.

6. My party, at starting, consisted of myself; Mr. George Stratford Gordon, my clerk; 2 chaprassis and my own Madrassi bearer.

Reception in Raniganj.

I arrived in Raniganj, East Indian Railway, on the evening of the 18th January, and was very kindly met at the station by S. Bailey Wells, Esq., the General Manager of the Bengal Coal Company's Collieries, (the largest colliery company in Bengal),

First inspection.

with whom I stayed for the night. On the following day Mr. Wells showed me over the positions and surface arrangements of his Company's Raniganj mines, and below-ground at one incline; and in the afternoon of the same day, Friday, I continued my journey on to Giridih, arriving there just before dark.

Reception at Giridih.

Dr. Walter Saise, the Manager of the East Indian Railway Company's Collieries, met me on the station platform at Giridih; and he very kindly and generously accommodated me with all I required during the whole time that I made Giridih the centre from which to inspect the mines in that neighbourhood. I began the work of inspection proper on Saturday the 20th January; living in the Birwadi bungalow while in Giridih, and in camp, and at Barakar dák bungalow the remainder of the time.

Beginning the inspections.

Centres from which the inspections were made.

7. The following were the centres from which the inspections were made, and the order in which I put up at those places:—

*Giridih.*—For East Indian Railway Company's, Bengal Coal Company's, Raniganj Coal Association, and a native colliery.

*Raniganj.*—For Bengal Coal Company's, and native mines there, also Nundi. The mines at and about Toposi; and Dubrona, and Bonbahal collieries beyond.

*Kalipahari.*—For 16 mines, 14 of which belonged to native owners.

*Asansole.*—For new Beerbhoom Coal Company's, and the mines at Seebpore, Baraboni, and Sorakdie.

*Sitarampur.*—For mines at Luchipur, Neamuthpur, Bamandiah, and Mouthdih.

*Barakar Dák Bungalow.*—For mines at Begunia, Kendua, Desherghur, Sanctoria, and Laikdi.

Inspection work.

8. I made 103 under-ground inspections of mines, comprising 67 separate mines or collieries, 32 of which were owned by Europeans, and 35 by natives. And at each I discussed with the officials on almost all matters connected with the working of the mines, and *tried* to become acquainted with the characteristics, habits, religion, caste, and everything connected with the mining people. I also

Special work.

made a special inspection, and report, as to coal and under-ground workings near a railway line. And in addition to keeping up with my ordinary reports, and correspondence, I wrote a special report for the Government of India as to the precautions that should be taken to prevent accidents in mines. And a Special Report for the Marine Department of the Government of Bengal, as to precautions to be taken with reference to explosive gas given off from coal on board coal-laden ships.

Help of staff.

9. The clerk, and the chaprassis, gave me valuable assistance when talking to the natives; the clerk often went below-ground to help when there was no English speaking person amongst the officials: and one of the two chaprassis

went below ground with me on nearly every occasion for the purpose of carrying the torch lamp, bag of instruments, etc.

Reception at collieries.

10. I was well received at all the collieries, and every one readily gave me all the information I asked for, but few gave me more than I asked for, but possibly that was because I generally asked for a great deal. My hearty thanks are due, and gladly given to all those who in any way gave me information and help.

Thanks to those who gave information and help.

Native owners and managers.

I found the natives most willing to learn, and some of them readily adopted any suggestions I made, and at once began to put right any defects about the pit top or machinery. I found some of the Hindu natives to be very nice people, and willing to answer and discuss a great many questions both directly and indirectly affecting the labour in mines. Some native owners requested me, both personally and in writing, to inspect their mines.

Some difficulties attending the inspections.

11. Although the before-named centres are probably the best places from which to inspect the mines, there are many difficulties attendant on staying at those places, and getting to and from, and inspecting the mines, that do not obtain in colder and more populous places, and where conveyances can more readily be got. Food is very expensive to get, there being little local food that an European can eat. Hired conveyances cannot be got in some of the centres without great expense, and loss of time. If the Inspector is to make daily inspections, and do the inspection work with reasonable dispatch, he must be dependent on no one, must be fully equipped, self-contained as it were, for going to and from the collieries, and making inspections at any hour, and without much previous arrangement.

All the mines inspected up to now are coal mines.

12. List of Mines inspected, with other particulars.

| Collieries and owners. | Name and number. | Pits and Inclines. | | | | Managers and Assistant Managers. | | Number of persons employed underground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and addresses. | Assistant Managers and addresses. | | |
| **Giridih.** | | | | | | | | | |
| Kurhurbari | 20 and 24 | Rectangular inclines. | ... | ... | Bhaddoah | Walter Saise, D.Sc. (London), M.M.C.E., Assoc., R.S.M., Birwadi, Giridih. | Thos. Adamson, Biswadih, Giridih. | 1,409 | The number of persons employed below-ground varies so greatly that the numbers given can only be approximate. |
| East Indian Railway Company, Giridih. | 17, 23B, 17A, 23C, and 23E. | Ditto | ... | ... | Kurhurbari, upper seam. | | | | |
| | Jubilee pit. | Oval and vertical pits. | 650 ft. | 15 ft. by 13 ft., oval. | Kurhurbari lower seam | | | | The oval shafts are mostly confined to the East Indian Ry. Co.'s Collieries. The long diameter is to provide room for pumps, etc. |
| | Bitagarha | Ditto | 236 ,, | 13 ft. by 11 ft., oval. | Ditto. | | | | |
| | Sanabad | Ditto | 234 ,, | 12 ft. dia. | Ditto. | | | | |
| | 7 Jogitand | Ditto | 286 ,, | Circular shafts. | Ditto. | | | | |
| | 1 Ditto. | Ditto | 178 ,, | 10 ft. dia. circular shafts. | Ditto. | | | | |
| | 5 Ditto. | Ditto | 100 ,, | Ditto | Ditto. | | | | Pillars are being worked out at these mines. |
| | 23D | Ditto | 429 ,, | Ditto | Ditto. | | | | |
| | 17B | Ditto | 291 ,, | Ditto | Ditto. | | | | |
| | 40 | Ditto | 200 ,, | Ditto | Ditto. | | | | |
| | 23 | Ditto | 106 ,, | Ditto | Ditto. | | | | |
| | 2C | Ditto | 156 ,, | Ditto | Ditto. | | | | |
| | 23B | Ditto | 282 ,, | Ditto | Ditto. | | | | |
| | 2D | Ditto | 120 ,, | Ditto | Ditto. | | | | |
| | 23E | Ditto | 220 ,, | Ditto | Ditto. | | | | |

| Collieries and owners. | Name and number. | Pits and Inclines. Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and Assistant Managers. Managers and addresses. | Assistant Managers and addresses. | Number of persons employed underground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| **Giridih—*contd.*** | | | | | | | | | |
| Serampore | 25, 11A, 18, 21, 16A. | Vertical, circular, and oval pits. | 80 ft. to 349 ft. | 10 ft. to 12 ft. | Lower Kurhurbari. | Walter Saise, D.Sc. (London) M.M.C.E., Assoc., R.S.M. Birwadi, Giridih. | Thos. Adamson, Biswadih, Giridih. | 1,587 | |
| | 42A, 7 Jog. No. 1, 42D. | Rectangular inclines. | | | | | | | |
| Kuldiah | No. 15 | Vertical and circular pits. | 299 ft. | 15 ft. | Kuraballi, or Kurhurbari. | Samuel Bailey Wells, (General Manager), Raniganj. | ... | 1,904 | Pillars are being worked out at these mines. |
| Bengal Coal Company, Limited, 2, Garstin's Place, Calcutta. | ,, 20 | Ditto | 222 ,, | 15 ,, | | | | | |
| | ,, 21 | Ditto | 134 ,, | 10 ,, | | | | | |
| | ,, 22 | Ditto | 142 ,, | 10 ,, | | William Foster, Kuldiah Colliery, Giridih. | Several Assistants. | | |
| | ,, 23 | Ditto | 165 ,, | 10 ,, | | | | | |
| | ,, 24 | Ditto | 165 ,, | 10 ,, | | | | | |
| Bhooriadih or Kurhurbari—Raniganj Coal Association, Limited, 4, Fairlie Place, Calcutta. | ,, 3 | Circular pit | 154 ft. | 12 ft. dia. | Kuraballi or Kurhurbari, lower or main seam. | John Murray, Giridih. | E. D. Mackinlay, Giridih. | 420 | Pillars being worked out in these mines. In one mine the work consists of taking away the coal from crushed pillars. |
| | ,, 15 | Ditto | 302 ,, | 12 ,, ,, | | | | | |
| | ,, 16 | Ditto | 259 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Rectangular incline. | | | | | | | |
| | ,, 12 | Ditto. | | | | | | | |
| Mooduncotta— | ,, 1 | Circular pit | 111 ft. | 10 ,, ,, | Mooduncotta, or 9 feet. | Ditto. | W. H. Topham, Mooduncotta, *vid* Madhupore. | 303 | Pillars being worked out in these mines. |
| Ditto. | ,, 4 | Ditto | 154 ,, | 10 ,, ,, | | | | | |
| | ,, 6 | Ditto | 82 ,, | 10 ,, ,, | | | | | |
| | ,, 7 | Ditto | 129 ,, | 14 ,, ,, | | | | | |
| | Nos. 1 and 2. | Rectangular inclines. | | | | | | | |
| | No. 3 | Ditto. | | | | | | | |
| Bayra Bayra Coal Association, Limited, Giridih. | ,, 1 | Vertical and circular pits. | 40 ,, | 6 ,, ,, | Kurhurbari | Ernest Myers, (Managing Proprietor), Giridih. | ... | 69 | |
| | ,, 2 | Ditto | 25 ,, | 8 ,, ,, | | | | | |
| | ,, 1 | Incline. | | | | | | | |
| | ,, 2 | Ditto. | | | | | | | |
| **Raniganj.** | | | | | | | | | |
| Raniganj, Nimcha, and Searsole— | 44 pit. 29 A, 37 | Circular, vertical and oval pits. | 150 ft. to 230 ft. | 12 ft. to 14½ ft. | Raniganj. Nimcha. | S. Bailey Wells, (General Manager), Raniganj, and G. W. Perkins, Raniganj. | G. W. Kedge, Raniganj. | 771 | |
| Bengal Coal Company, Limited, 2, Garstin's Place, Calcutta. | No. 1 | Incline | ,, | ,, ,, | Searsole. | | | | |
| Mudhabpur— | Nos. 1, 8, 4 and 9. | Circular pits | 72 ft. to 110 ft. | 10 ft. dia. | Mudhabpur. | S. Bailey Wells (General Manager). | H. M. Daly, Mudhabpur Colliery, Raniganj. | 301 | |
| Ditto. | No. 7. | Oval pit | 72 ft. to 110 ft. | 15 ft. by 9 ft. | | | | | |
| Singaran Valley Coal concern—John Chambers & Co., 14, Clive Street, Calcutta. | ,, 1 | Circular pit | ... | ... | Jote Janokey | ... | ... | 129 | |
| | ,, 2 | Ditto. | | | | | | | |
| | ,, 3 | Ditto. | | | | | | | |
| | ,, 4 | Incline. | | | | | | | |
| Pooranadeep—A. Whyte, Raniganj. | ,, | Quarry outlet | ... | ... | Pooranadeep, lower seam. | A. Whyte, Jnr., Raniganj. | Shoroda Prosad Gosal, Pooranadeep Colliery, Raniganj. | 27 | |
| | ,, 1 | Circular pit | 70 ft. | 10 ft. dia. | | | | | |
| | ,, 2 | Ditto | 67 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Ditto | 145 ,, | 12 ,, ,, | | | | | |

| Collieries and owners. | Name and number. | Pits and Inclines. | | | | Managers and Assistant Managers. | | Number of persons employed under ground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and addresses. | Assistant Managers and addresses. | | |
| **Raniganj—*contd.*** | | | | | | | | | |
| Toposi—Raniganj Coal Association, Ld., 4, Fairlie Place, Calcutta. | No. 1 | Circular pit | ... | ... | Jojanaki | John Murray, Giridih. | R. Augier, Toposi, *vid* Raniganj. | | |
| | ,, 2 | Ditto. | | | | | | | |
| | ,, 3 | Ditto. | | | | | | | |
| | ,, 4 | Ditto. | | | | | | | |
| Nundi — Adjai Coal Co., Raniganj. | ,, 1 | Ditto | 60 ft. | 12 ft. dia. | ... | Robert Mitchell. Nundi, *vid* Raniganj. | ... | ... | A new colliery |
| | ,, 3 | Ditto | 70 ,, | 12 ,, ,, | | | | | |
| | ,, 4 | Ditto | 100 ,, | 12 ,, ,, | | | | | |
| | ,, 2 | Circular air pit | 75 ,, | 8 ,, ,, | | | | | |
| Searsole—K. R. Malia and K. D. Malia, Raniganj. | ... | 4 working pits | 60 ,, to 80 ft. | 12 ,, ,, | Searsole | Chandra Mohun Das, (General Manager), Raniganj. | Goda Dhur Pundit, (Manager), Raniganj. | 310 | |
| | | 3 sinking pits | 60 ft. to 80 ft. | Some 10 ft. diameter. | | | | | |
| | | 2 inclines. | | | | | | | |
| Jamaria—Ditto | No. 6 | Circular pit | 100 ,, | 12 ft. dia. | Jamaria | B. B. Mitra, Jamaria Colliery, Raniganj. | G. C. Mookerjee Jamaria Colliery, Raniganj. | 270 | |
| | ,, 9 | Ditto | 110 ,, | 9 ,, ,, | | | | | |
| | ,, 10 | Ditto | 110 ,, | 9 ,, ,, | | | | | |
| | ,, 11 | Ditto | 115 ,, | 12 ,, ,, | | | | | |
| | ,, 13 | Ditto | 126 ,, | 12 ,, ,, | | | | | |
| | Nos. 2, 3 | Inclines. | | | | | | | |
| Roghunath Chuck—Jagan Nath Marwari, Raniganj. | No. 1 | Circular pit | 100 ,, | 12 ,, ,, | Roghunath Chuck. | Chakur C. Pal, Roghunath Chuck, *vid* Raniganj. | K. N. Sirkar, Roghunath Chuck, Raniganj. | 81 | |
| | ,, 2 | Ditto | 62 ,, | 10 ,, ,, | | | | | |
| | ,, 3 | Ditto | 79 ,, | 10 ,, ,, | | | | | |
| | ,, 4 | Ditto | 80 ,, | 12 ,, ,, | | | | | |
| New Bonbohal—Ditto. | ,, 1 | Ditto | 75 ,, | 10 ,, ,, | Bonbohal | Owner is the Manager. | ... | 58 | |
| Munghulpur—New Beerbhoom Coal Company, but leased to D. D. Bhuttacharjee, Raniganj. | ,, 1 | Ditto | 100 ,, | 12 ,, ,, | Sonachora | Doorga Das Bhuttacharjee, Raniganj. | Surendro Nath Majoomdar, Raniganj. | 58 | |
| | ,, 2 | Ditto | 100 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Incline. | | | | | | | |
| Bonbohal — Native Friend & Co., Raniganj. | ,, 1 | Circular pit | 112 ,, | 10 ,, ,, | Bonbohal | Shamachurn Banerjee; Raniganj. | ... | 60 | This mine is leased to Shamachurn Banerjee. |
| | ,, 2 | Ditto | 110 ,, | 10 ,, ,, | | | | | |
| Dubrona—Oodiya Ch. Mundal, 114, Banitola, Hautkola, Calcutta. | ,, 1 | Incline. | ... | ... | ... | ... | ... | 33 | |
| Mamudpur — H. C. Chongder, Guskarah. | ,, 1 | Oval pit | 51 ft. | 10 ft. × 7 ft. | ... | C. M. Roy, Raniganj. | ... | 30 | |
| **Kalipahari.** | | | | | | | | | |
| Ghoosic — Ram Bhundoo Chatterjee, Kalipahari. | ,, 1 | Circular pit | 81 ft. | 12 ft. dia. | Ghoosic | R. C. Mookerjee, Ghoosic, *vid* Kalipahari. | ... | 200 | |
| | ,, 2 | Ditto | 71 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Ditto | 110 ,, | 12 ,, ,, | | | | | |
| | ,, 4 | Ditto. | | | | | | | |

| Collieries and owners. | Name and number. | Pits and Inclines. | | | | Managers and Assistant Managers. | | Number of persons employed underground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and addresses. | Assistant Managers and addresses. | | |
| **Kalipahari—*contd.*** | | | | | | | | | |
| Ghoosic—Boleram Coal Co., Ghazipur. | No. 1 | Circular pit | 105 ft. | 12 ft. dia. | Ghoosic | M. N. Mookerjee, Kalipahari. | ... | 170 | |
| | „ 2 | Ditto | 113 „ | 12 „ „ | | | | | |
| | „ 4 | Ditto. | | | | | | | |
| Ghoosic—Ghoosic Coal Co., Kalipahari. | „ 1 | Circular pit | ... | ... | Ditto | S. P. Banerjee, Kalipahari. | ... | 145 | |
| | „ 3 | Incline. | | | | | | | |
| North Ghoosic—Indian Coal Co., 36, Strand, Calcutta. | „ 4 | Circular pit | 84 ft. | 12 ft. dia. | Ditto | K. N. Banerjee, Ghoosic, *vid* Kalipahari. | ... | 48 | |
| | „ 5 | Ditto | 97 „ | 12 „ „ | | | | | |
| Damrah—Damrah Coal Co., Kalipahari. | „ 1 | Ditto | 80 ft. | 12 „ „ | Ditto | K. N. Burman (Managing Proprietor), Kalipahari. | K. C. Sirkar (Manager), Kalipahari. | 250 | |
| | „ 2 | Ditto | 42 „ | 12 „ „ | | | | | |
| | „ 3 | Incline. | | | | | | | |
| Ghoosic—Damuda Coal Co., 5 & 6, Hare Street, Calcutta. | „ 1 | Circular pit | 90 „ | 12 „ „ | Ditto | J. C. Martin, Sitarampur. | E. D. Onraet, (Assistant in charge), Ghoosic. | 100 | |
| | „ 2 | Ditto | 110 „ | 12 „ „ | | | | | |
| East Ghoosic—Mr. Simon Creet, 8-3, Loudon Street, Calcutta. | „ 1 | Ditto | 125 „ | 10 „ „ | Ditto | T. Stephen, Ghoosic, *vid* Kalipahari. | C. Mackertich, Ghoosic, *vid* Kalipahari. | 62 | |
| | „ 2 | Ditto | 135 „ | 11 „ „ | | | | | |
| Mosla—Burdwan Coal Co., Bhowanipur. | „ 1 | Ditto | 51 „ | 12 „ „ | Mosla | Grish C. Sirkar (Managing Proprietor), Kalipahari. | ... | 125 | |
| | „ 2 | Incline. | | | | | | | |
| Chatapathar—Dwarkanath Khetrie, 66, Cross Street, Calcutta. | „ 3 | Circular pit | 50 „ | 10 „ „ | Chatapathar | I. C. Sirkar, Kalipahari. | ... | 86 | |
| | „ 4 | Ditto | 80 „ | 12 „ „ | | | | | |
| | „ 1 | Incline. | | | | | | | |
| Nicah—Nadia Coal Co., Nadia, Ranaghat Station. | „ 1 | Circular pit | 48 „ | 12 „ „ | ... | B. L. Chowdhury, Kalipahari. | ... | 70 | |
| | „ 2 | Incline. | | | | | | | |
| Keshubgunge—R. L. Dutta & Co., Paunchuntola, Howrah. | „ 1 | Circular pit | 47 „ | 12 „ „ | Keshubgunge. | B. K. Dutta, Kalipahari. | Sreenath Boral, Kalipahari. | 50 | |
| | „ 4 | Incline. | | | | | | | |
| Keshubgunge—Standard Coal Co., Kalipahari. | „ 1 | Circular pit | 98 „ | 12 „ „ | Keshubgunge. | Durga Churn Dutta, Kalipahari. | Kanye Lal Mitter, Kalipahari. | 40 | |
| | „ 2 | Ditto | 115 „ | 10 „ „ | | | | | |
| Keshubgunge—Poolchand, Marwari, 50, Suttaputty, Calcutta. | „ 1 | Oval pit | 117 „ | 7 ft. by 14 ft. | Keshubgunge. | Joharmull Marwari, Kalipahari. | ... | 54 | |
| | „ 8 | Circular pit | 110 „ | 8 ft. dia. | | | | | |
| Baghboni—Baghboni Coal Co., Kalipahari. | ... | 1 Old pit | .... | ... | Baghboni | K. N. Chatterjee, Baghboni Colliery, Kalipahari. | | 50 | |
| | | 1 Pumping pit. | | | | | | | |
| | | 1 Incline. | | | | | | | |
| **Asansole.** | | | | | | | | | |
| Charanpore.—Messrs. Apcar & Co., 19, Radha Bazar, Calcutta. | No. 2 | Circular pit | 220 ft. | 12 ft. dia. | Poniata | F. J. Agabeg, Bora Chuck House, Sitarampur. | E. M. Patterson, Charanpore Colliery, Asansole. | 331 | |
| | „ 4 | Ditto | 205 „ | 12 „ „ | | | | | |
| | „ 12 | Ditto | 60 „ | 10 „ „ | | | | | |
| | „ 17 | Ditto | 102 „ | 10 „ „ | | | | | |
| | „ 13 | Circular air pit | 50 „ | 10 „ „ | | | | | |
| Bora Chuck—Ditto | „ 1 | Circular pit | 80 „ | 12 „ „ | Bora Chuck | Ditto | Ditto | 27 | |
| | „ 2 | Incline. | | | | | | | |

| Collieries and owners. | Name and number. | Pits and Inclines. | | | | Managers and Assistant Managers. | | Number of persons employed underground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and addresses. | Assistant Managers and addresses. | | |
| **Asansole—*contd.*** | | | | | | | | | |
| Dhadka—New Beerbhoom Coal Co., Ld., 103, Clive Street, Calcutta. | ... | Circular and vertical pits. | 40 ft. to 300 ft. | 13 ft. dia. | Dhadka—North Noonia. | Septimus Heslop, (General Manager), Asansole. | Aubrey Gregory, (Assistant in charge), Asansole. | 530 | |
| | | Rectangular inclines. | | 8 ft. × 10 ft. | | | | | |
| Seebpore—Katras Jherriah Coal Co., Ld., Asansole. | ... | 6 Vertical pits | 40 ft. to 120 ft. | 12 ft. dia. | Seebpore and Koitee. | John English, Seebpore, *vid* Asansole. | W. F. Bampton, (Assistant to Manager), Seebpore, *vid* Asansole. | 503 | |
| | | 4 Ditto | | 8 ft. ,, | | | | | |
| | | 1 Incline. | | 8 ft. × 8 ft. | | | | | |
| Sorakdie—N. A. Hodges, Asansole. | No. 1 | Vertical pit | 70 ,, | 12 ft. dia. | Fatehpore | C. H. Whiffen, Sorakdie, *vid* Asansole. | ... | 23 | |
| | ,, 2 | Ditto | 115 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Ditto. | | | | | | | |
| Baraboni—New Baraboni Coal Co., 67, Strand Road, Calcutta. | ,, 1 | Circular pit | 141 ,, | 13 ,, ,, | Baraboni | P. C. Dey, Charanpore P. O., Asansole. | S. B. Roy, Charanpore P. O., Asansole. | 120 | |
| | ,, 2 | Incline. | | | | | | | |
| Old Baraboni—Baraboni Coal Co., Ld., 18, Swallow Lane, Calcutta. | ... | 4 Rectangular and vertical pits. | 30 ft. to 190 ft. | ... | Baraboni | J. D. Khetrie, Charanpore P. O., Asansole. | Neelmoni Chodri (Superintendent), Charanpore P. O., Asansole. | 300 | |
| | | 3 Inclines. | | | | | | | |
| **Sitarampur.** | | | | | | | | | |
| Luchipur—Equitable Coal Co., Ld., 1 and 2, Clive Street, Calcutta. | ... | Circular and rectangular pits. | 160 ft. to 260 ft. | 17 ft. × 6 ft. | Luchipore | William Miller, Desherghur, *vid* Barakur. | Andrew Russell, (Assistant in charge), Neamuthpur, Sitarampur. | 540 | |
| | | | | 12 ft. dia. | | | | | |
| | | Air pit. | 100 ,, | 6 ,, ,, | | | | | |
| Sodepore—Bengal Coal Co., Ld. | No. 1 | Circular pit | 164 ,, | 12 ,, ,, | Sodepore | R. S. Treherne, Sodepore Colliery, Sitarampur. | ... | 377 | |
| | ,, 2 | Ditto | 70 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Incline. | | | | | | | |
| Luchipur Barmonnia | 2 pits. | Circular pits | 100 ft. to 270 ft. | 12 ft. ,, | Luchipore | J. C. Martin, Sitarampur. | ... | 878 | |
| Damuda | 3 pits. | Ditto | | ... | Ditto. | | | | |
| Damuda Coal Co., Ld., 5 and 6, Hare Street, Calcutta. | 2 pits and 1 Incline. | Ditto | ... | ... | Bharut Chuck. | | | | |
| Belrooi—New Beerboom Coal Co., Ld. | No. 13 | Ditto | 300 ft. | 14 ft. dia. | Belrooi | Septimus Heslop, (General Manager), Asansole. | J. H. Charlesworth, (Assistant in charge), Sitarampur. | 225 | |
| | ,, 12 | Ditto | 347 ,, | 14 ,, ,, | | | | | |
| | ,, 10 | Ditto | 120 ,, | 10 ,, ,, | | | | | |
| Luchipur Bholanath Dhur & Co., 2, Roop Chand Roy's Street, Calcutta. | ,, 1 | Ditto | 96 ,, | 12 ,, ,, | Luchipur | L. C. Mookerjee, Luchipur, *vid* Sitarampur. | ... | 100 | Leased to Hurry Churn Bose of 71, Patriggatta Street, Calcutta. |
| | ,, 6 | Ditto | 150 ,, | 12 ,, ,, | | | | | |
| | ,, 3 | Incline. | | | | | | | |
| Luchipur—Ditto. | ,, 1 | Circular pit | 90 ,, | 10 ,, ,, | Luchipur | N. C. Cowar, Sitarampur. | ... | 45 | |
| | ,, 2 | Incline. | | | | | | | |
| Luchipur—Juggessur Ray & Co., Belrooi, Sitarampur. | ,, 1 | Gin pit | 40 ,, | 10 ,, ,, | Luchipur | U. C. Mookerjee, (Managing Proprietor). | ... | 48 | |
| Bamandiah—Bhoolanath Dhur & Co., 2, Roop Chand Roy's Street, Calcutta. | ,, 5 | Circular pit | 150 ,, | 12 ,, ,, | Bamandiah | L. C. Mookerjee, Luchipur, *vid* Sitarampur. | ... | 38 | |
| Bamandiah—Moodun Sodun Roy, Belrooi, Sitarampur. | ,, 1 | Ditto | 145 ,, | 12 ,, ,, | Bamandiah | H. P. Mookerjee, (Contractor) acts as the Manager. | ... | 62 | |

| Collieries and owners. | Name and number. | Pits and Inclines. Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and Assistant Managers. Managers and addresses. | Assistant Managers and addresses. | Number of persons employed underground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| **Sitarampur—*continued.*** | | | | | | | | | |
| Bamandiah—P. C. Dutt, Coal Depôt, Howrah. | No. 1 | Circular pit | 90 ft. | 12 ft. dia. | Bamandiah | Hem Chunder Dutt. | ... | 62 | |
| | ,, 2 | Ditto | 100 ft. | 10 ,, | | | | | |
| Mouthdih—Burdwan Coal Co., Bhowanipur. | ,, 3 | Ditto | 80 ft. | 12 ,, | Mouthdih | Grish Chunder Sircar, (Managing Proprietor), Kalipahari. | Soshi Bhusan Mitra, (Assistant in charge), Sitarampur. | 72 | |
| | ,, 1 | Incline. | | | | | | | |
| **Barakar.** | | | | | | | | | |
| Desherghur—Equitable Coal Co., Ld., 1 & 2, Clive Street, Calcutta. | 6 pits | Round and vertical. | 120 ft. to 409 ft. | 10 ft. to 17 ft. dia. | Desherghur | William Miller, Desherghur, Barakar. | William Weir, Desherghur, Barakar. | 910 | |
| | 2 Inclines. | | | | | | | | |
| Sanctoria—Bengal Coal Co., Ld., 2, Garstin's Place, Calcutta. | 3 pits | Round and oval | 90 ft. to 450 ft. | 12 ft. to 15 ft. 6 in. | Ditto | E. H. Wells, Desherghur P. O., Barakar. | ... | 1,100 | Manager has an Assistant. |
| | 7 Inclines | ... | | ,, ,, | Ditto. | | | | |
| | 4 pits | Round and oval | ,, | ,, ,, | Sanctoria | S. B. Wells (General Manager). | | | |
| | 2 Inclines | | ,, | ,, ,, | | | | | |
| Laikdi—Ditto | No. 1 | Incline and pit. | ... | ... | Laikdi | Jas. Mackintosh, Barakar. | Geo. Dilkinson, (Assistant to Manager), Barakar. | 489 | This is being mostly worked as an open quarry. |
| | ,, 2 | Ditto. | | | | | | | |
| Borrea—New Beerbhoom Coal Co., Ld., 103, Clive Street, Calcutta. | 4 pits | Circular and vertical.. | 97 ft. to 150 ft. | 12 ft. and 13 ft. dia. | Borrea, third seam. | S. Heslop, (General Manager), Asansole. | R. J. Browne, (Assistant in charge), Barakar. | 1,198 | |
| | No. 1 | Pumping pit. | | | | | | | |
| Kendua—Bengal Iron and Steel Co., Ld., Kendua, *viâ* Barakar. | 2 pits | Round | 102 ft. to 300 ft. | 16 ft. and 11 ft. | Baltara | Thomas Carr, Kendua Colliery, Barakar. | Ivy Robertson, (Assistant to Manager), Kendua Colliery, Barakar. | 144 | |
| | 3 ,, | Elliptical and vertical. | | 14 ft. × 11 ft. and 19 ft. × 13 ft. and 13 ft. × 11 ft. | | | | | |
| Bagunia—Robert Scorer, Barakar. | No. 4 | Circular pit | 150 ft. | 12 ft. dia. | Bagunia | Robert Scorer, (owner is Manager), Barakar. | C. Nairne (Assistant in charge), Barakar. | 35 | |
| Kumardubi—Barakar Coal Co., Ld., 39, Strand, Calcutta. | ,, 1 | Ditto | 80 ,, | 12 ,, | Laikdi | Henry Cyrio Veasey, Barakar. | Henry Bull, Barakar. | 415 | |
| | ,, 2 | Ditto | 120 ,, | 12 ,, | | | | | |
| | ,, 3 | Incline. | | | | | | | |
| Gangootiya—Bengal-Nagpur Coal Co., Ld., 21, Canning Street, Calcutta. | ,, 2 | Circular pit | 80 ,, | 13 ,, | Sanctoria | P. H. Ashcroft, Barakar. | ... | 220 | |
| | Paterson | Ditto | 60 ,, | 6 ,, | | | | | |
| | Nagpur | Ditto | 80 ,, | 14 ,, | | | | | |
| | Sir John | New pit. | | | | | | | |
| Bagunia—Benori Lal Mookerjee, Barakar. | No. 1 | Incline | ... | ... | Bagunia | Owner acts as the Manager. | ... | 210 | |
| | ,, 2 | Ditto. | | | | | | | |
| | ,, 1 | Circular pit | 59 ft. | 14 ft. dia. | | | | | |
| Bagunia—Laek Coal Co., Barakar. | ,, 1 | Incline | ... | ... | Ditto | H. C. Mookerjee, (Managing Proprietor), Barakar. | G. C. Mookerjee, Barakar. | 170 | |
| | ,, 2 | Circular pit | 60 ft. | 14 ft. dia. | | | | | |
| | ,, 3 | ,, | 101 ,, | 13 ,, | | | | | |
| | ,, 5 | ,, | 145 ,, | 14 ,, | | | | | |

| Collieries and owners. | Name and number. | Pits and Inclines. | | | | Managers and Assistant Managers. | | Number of persons employed underground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | Kind. | Depth in feet. | Diameter in feet. | Seams. | Managers and addresses. | Assistant Managers and addresses. | | |
| **Barakar—*continued.*** | | | | | | | | | |
| Bagunia—Nundo Lal Garia, Barakar. | No. 1 | Circular pit | 70 ft. | 14 ft. dia. | Bagunia | Ram Chunder Garia, Barakar. | ... | 33 | |
| | „ 2 | „ | 110 ft. | 15 „ | ... | | ... | 50 | |
| | „ 3 | Incline | ... | ... | ... | | ... | 140 | |
| Bagunia—Jogendro Nath Mookerjee, Bantara, Howrah. | „ 2 | Circular pit | 45 ft. | 13 ft. dia. | Bagunia | O. C. Chatterjee, Barakar. | Bhogaban Samonto, (Assistant in charge), Barakar. | 350 | |
| | „ 3 | Ditto | 120 „ | 14 „ | | | | | |
| | „ 1 | Incline. | | | | | | | |
| Bagunia—Deni M. Sandal, Barakar. | „ 1 | „ | ... | ... | Ditto | Nogendro Narain Dey, Barakar. | ... | 36 | |
| | „ 2 | „ | ... | ... | ... | | ... | 20 | |

## Details of Mines Inspected, with other information.

Names of mines or collieries.

13. *Names of Mines or Collieries.*—These are in nearly every case the same as the place where the mine or colliery is situated, consequently, where there are several mines near together, there are also several of the same name; for example, 4 had the name of "Ghoosic," 3 the name of "Keshubgunge," 4 had "Luchipur," 3 had "Bamandiah," 4 had "Bagunia," and 3 had the name of "Mouthdih."

This is a little confusing, and would be very inconvenient, especially to owners, if there was a Mines Act providing for exemptions, the establishment of special rules, etc.

There need be no connection between the name of a mine and the name of a place; the owner can call it anything he pleases, and I would suggest that each mine should have its own distinctive name.

Names of seams.

14. *Names of Seams.*—There were only a few distinctive names given for the seams; the names given were generally the names of the places where the colliery was being worked. The seams do not appear to have been correlated from district to district; and the mode of occurrence of the coal seams, and their very variable thicknesses, would apparently make this a difficult task.

Thicknesses of seams.

15. *Thicknesses of Seams.*—These varied greatly.

As this is a matter affecting the safety of working, and the conditions under which females and children work in the mines, I give the following particulars of the thicknesses of the seams inspected:—

4 feet 9 inches to 8 feet.
5 feet to 6 feet 4 inches.
5 feet to 12 feet.
5½ feet.
2 of 6 feet.
6 feet to 9 feet.
6 feet to 9½ feet.
6 feet to 16 feet.
7 of 7 feet.
7 feet to 9 feet.
8 feet to 30 feet.
2 of 9 feet.
10 feet.
3 of 11 feet.
11 feet to 16 feet.
11 of 12 ft.
12 feet to 15 feet.
2 of 13 feet.
13 feet to 15 feet.
2 of 14 feet.
2 of 14½ feet.
15 feet.
2 of 16 feet.
16 feet to 18 feet.
3 of 18 feet.
5 of 20 feet.
21 feet.
22 feet.
2 of 22 feet to 25 feet.
2 of 25 feet.
25 feet to 32 feet.
26 feet.
26 feet to 35 feet.
30 feet.
35 feet.
90 feet to 100 feet.

Nearly the whole of the seams are thick enough for a person to walk about in an erect position, and only a few that are not tall enough to allow the full "tokri" (basket) in which coals are carried to be carried on the head. Then we come to seams so thick that it is difficult to see the nature of the roof overhead, especially when it has been blackened by soot from the kerosene oil lamps, and has a layer of smoke from the same source hanging overhead. In the thicker seams the work is generally done in sections, so that there is generally several feet of coal overhead or under foot or both, except in the galleries that are finished by all the coal having been worked out that has to be worked. It is also a common rule to leave from 1 foot to 3 feet of roof coal unworked to support the roof stone above, especially where there is some shale between the coal seam and the sandstone rock. The coal often forms a sounder roof than the shale, and this is always given as the reason for leaving the coal; but in many parts it is inferior coal and unfit to work, and there it is left the thickest; where the coal is good, as little as possible of it is left.

Coal left for roof.

Nature of the coal.

16. *Nature of Coal.*—The coal is generally strong or hard, some of it more so than a great deal of the coal in England. It has the ordinary faces and cleavage planes, as prevails with English coals; and often has slippery and sooty inclined faces running through the seam; these are amongst the most frequent causes of accidents from falling coal in English mines, and they require to be very carefully guarded against. The seams do not appear to be much split up into sections by frequent faults, but there are some, and the principal faults in the Bengal coal field run east and west. The very numerous trap dykes, of varying thicknesses and directions, with burnt coal of "jama" adjacent to them, very fully make up for the small number of faults. The coal seams appear to lie in detached patches or basins, which is much the same in effect as the coal field being split up by faults, with the exception that the seams lie at a very even distance from the surface, whereas, faults would cause the different sections of the same seam to lie at very varying distances from the surface.

Faults.

Trap dykes.

Mode of occurrence of coal seams.

Use of coal.

The coal appears to be mostly used for raising steam in boilers, brick and lime burning, etc. In a hot country like India, house fire coal is not in such great demand as in colder European climates, and this is one of the disadvantages of Indian mining, as it greatly affects the selling price of the coal. The best paying collieries in England may be said to be those that raise a large quantity of good quality house fire coal. Still it appears likely that the sale of house fire coal in India may be much increased; but the coal for this purpose should be carefully selected, and cleaned or freed from dirt. The consumer requires clean coal, or coal only and not dirt; this is necessary for the purposes for which it is used, as well as to avoid paying heavy carriage on useless dirt. Cleaning coals for the market, as soon as it leaves the pit mouth, is universally practised in England, and has become almost a fine art; but in India it is comparatively little practised.

Little house fire coal being required, is one disadvantage of Indian mining.

Spontaneous firing of coals.

Some of the coals in India are liable to take fire spontaneously. This should be constantly borne in mind by owners and managers, especially when they are tempted to make the coal pillars too thin, or thin them after they are first formed; or leave coal dust in heaps in the mine, instead of bringing it out daily as it is made. Another question, closely allied to this, is the practice that appeared to be recognised in some mines, of allowing the work-persons to make large coal fires in the galleries of the mine. The several large fires that are now burning in Indian mines, and have been burning for years, as well as some that have recently burned themselves out; the very large sums of money they have cost, the great inconvenience, and, in some cases, the great loss of

Under-ground fires.

life they have caused; as well as the destruction and very great loss of life caused by fires, that were at first very simple in themselves, in English mines, ought to serve as a strong and ample warning for every one to do all they can to avoid an under-ground fire even on a small scale, except of course in a properly constructed furnace.

Nature of roof.

17. *Nature of roof.*—The roof on the coal of many mines is a shale varying in thickness from a few inches to several feet; above that is the sandstone rock. Sometimes the hard sandstone comes right down to the coal and forms a very sound and good roof; but frequently it is found that the under-surface of the rock developes "papra" or scales when exposed to the weathering effect of the damp air; and then it has to be frequently examined by the "*chal jharu*" or roof sweeper, roof examiner, who goes along with "*sulfi*" or "Bunter," a long examining pole shod with iron at one end, sounds the roof, and "*roj roj papri girata*," every day causes some of the scales to fall, to avoid accidents by their falling on the work persons' bodies. The shale roof, where bared, is generally insecure and requires to be timbered. It is often best to pull down the rock scales rather than try to secure them by timber. In a few mines, not far below the surface, the sandstone rock is soft and has fallen making holes through to the surface. Where the sandstone is hard and strong it will stand over large areas without support, but when it begins to give way and prepare for falling, it is a very critical time, and requires the greatest care and caution; for it falls with a loud noise like thunder, sets up gusts of wind, breaks off and comes to the ground in great heavy blocks, and threatens to break down everything. It is the best policy to have as few persons in the mine as possible when such a fall is taking place.

Dip of seams.

18. *The dip.*—The dip or inclination or lie of the seams varies greatly both in direction and amount. The seams have generally only a small inclination, the greatest is 1 in $3\frac{1}{8}$, and the least 1 in 100. Other common dips or inclinations are 1 in 4, 1 in 5, 1 in 8, 1 in 10, 1 in 15, and 1 in 20.

Names given to Managers and Assistants.

19. *Managers and Assistants.*—There appears to be a little want of uniformity in the descriptive names of the higher officials; as well as in the experience, and the amount of personal supervision exercised. But this is quite excusable in India where, hitherto, every one has gone on in his own way.

There are at the mines inspected—

| | |
|---|---|
| 4 General Managers. | 2 Assistants to Managers. |
| 9 Managing Proprietors. | 4 Under-ground Assistants. |
| 49 Managers. | 3 Overmen. |
| 11 Under-Managers. | 1 Under-ground Overseer. |
| 11 Assistant Managers. | 1 Overlooker. |
| 7 Assistants in charge. | 6 Mining Inspectors. |

Managers, and Assistant Managers are probably the best names for the higher officials.

English certificates.

English first class certificates are held by 11 of the officials.

English experience.

Of the Managers and Assistants, about 12 have had English experience in mining.

Experience of officials.

Some of the officials, especially at native mines, have had very little experience indeed of mining; a few have only been acquainted with mines for a few months. With the exception of a very few of the mines, I found all round an almost entire absence of such essential principles and practice of mining knowledge as mine ventilation, timbering, etc.

Under-ground inspections by Managers.

The number of under-ground inspections made by Managers is represented as follows:—

22, Managers said they inspected under-gound daily.
13, once every second day.
5, once every third day.
3, once every fourth day.
18, once every week.
4, once every fortnight.
2, once every month.

Of course, there were said to be other officials acting in their absence.

Successful mines.

It may apparently be taken as an axiom that the successful mines in India are those where the Manager, or some one acting for him, is acquainted with the language of the people, comes into contact with them daily, is in sympathy with them, willing to listen to their grievances, ready to act justly towards them, and to show them that although the success of his company is never being lost sight of he has a pleasure in promoting their welfare in every possible way. Of course, competency is one of the first requisites; and the management should not only be occasionally seen and heard, but it should be regularly felt throughout the colliery.

Necessity for certificates of fitness as Managers.

I think that the approaching conditions of Indian mining, and the backwardness of a very large number who have the management of mines, in the knowledge that is necessary to enable them to overcome difficulties and avert dangers, are sufficient proofs of the necessity for Mine Managers being required to hold certificates of their fitness to manage mines. While making this proposal, I am greatly conscious of the very varied qualifications and experience of the present Managers, on the effect that changes have on native minds, and of the very slow and gradual way that new or altered systems should be introduced; but over and above all this, SAFETY should be the watchword. With a view, therefore, of disturbing as little as posible those who are at present managing mines, and not to leave them doubting as to the possibilities; as well as to give them an opportunity of expressing an opinion on a matter so closely affecting themselves, I offer the following as a proposal:—

Proposal of kinds of certificates.

Every mine employing more than 100 persons below-ground, during any 24 hours, should be under the control of a first class certificated Manager who should, either by himself or through a certificated Assistant Manager, exercise daily personal supervision over all parts of the mine. Such Assistant Manager may have either a first or a second class certificate. Mines employing less than 100 persons below-ground, during any 24 hours, should be similarly managed either by a first class or by a second class certificated Manager.

Certificates of competency.

There should be a first class and a second class certificate of competency, to be gained by examination.

Certificates of service.

There should also be a first class and a second class certificate of service.

English certificate.

Certificates gained under the English Mines Acts should be recognized.

To whom granted.

First class certificates of service to be granted to those persons who are at the time of the passing of a Mines Act acting as Managers of mines where more than 100 persons are employed below-ground, and who have so acted for a period of not less than 5 years.

Second class certificates to be granted to—

1. Persons who have within the last 5 years been Manager of a mine for less than 5 years but not less than 2 years.
2. Persons who have for not less than 3 years acted substantially as an

Assistant Manager directly under a person who had, either an English first class certificate, or who established his claim for a first class certificate of service.

3. Or, a person who has for the last 3 years been Manager of a mine where less than 100 persons were employed below-ground.

This question of certificates would put new life into the management, create a striving to become fit to manage mines, and to be able to obtain a certificate for the purpose.

Duties of inferior officials.

20. *Other Officials.*—These are made up of sirdars, who generally have the control of the actual work of a few gangs of men, see that they work in the right place, that they do not rob the pillars, and generally to carry out the orders of the superior officers. Then there are special sirdars, such as "Sinking Sirdars," "Drifting Sirdars," Sirdars over dust carriers, etc.; they all have the immediate charge and control of the work in their own department.

Contractors.

*Contractors.*—Though not officials in the ordinary sense in which the word is used, yet where they are employed they occupy a very important position, and probably exercise as much control over the working of the mine as several of the other officials put together. His wages depend on the quantity of coal sent out, he brings in the labourers, he pays many of the expenses connected with the working of the mine, he pays all his own men directly, goes into the mine daily, often makes inspections, knows all his people, has great influence with them, and is generally successful. Many of the contractors are intelligent natives, and some are Europeans.

Engineers.

*Engineers.*—Engineers have control over, and sometimes inspect, the machinery.

Babus.

*Babus.*—Babus who exercise a sort of general control under the higher officials; bring information to Manager, and carry back his orders, and assist him, or speak for him to the natives. He often occupies a very useful place in many respects. He is not classed among the many Babu clerks, writers, etc., that are employed at every mine.

Inspections and reports.

21. *Inspections and Reports.*—There were some sort of inspections made in every mine; but definite inspections by recognized officials, at times devoted to that purpose, were somewhat rare. The total number of mines where regular inspections were said to be made were 48; but a great majority of these consisted of an official being in the mine during the shift to see that the work goes on all right, and not inspections, with inspection as a definite aim.

Written reports.

*Written reports.*—Written reports of the results of inspections were made at 20 of the mines as follows:—

| Of under-ground works. | Shafts. | Machinery. |
|---|---|---|
| Daily at 13 mines<br>Weekly at 7 mines | Daily at 10 mines<br>Weekly at 10 mines | Daily at 5 mines.<br>Weekly at 12 mines.<br>Monthly at 3 mines. |

Examination by workmen.

*Examination of own working place by workman.*—The workmen, throughout, appeared to know how to examine the roof and coal of their working places, and apparently made such examinations in most cases.

Systems of working.

22. *Systems of working.*—The principal system of working throughout Bengal, and the only system at native mines, is the "pillar and stall," or "stoop and room." The coal is worked out in galleries of very variable widths, to form pillars of coal of almost all possible shapes and sizes. The most common widths for galleries are 10 feet, and 12 feet; and there appears to be a greater tendency to form square or rectangular pillars, and of a greater size than has

prevailed hitherto. Sometimes the galleries are driven in the top coal, some in middle coal, some in bottom, and some in steps taking out the whole of the coal from floor to roof. Sometimes the roof coal, and at other times the floor coal, is left for a time until there is a more urgent demand for the coal, or the getter wants to get some easy "pice" in preparation for a "púja."

A system being successfully worked at Giridih, is a modification of the "pillar and stall" and the "long wall" systems. In this system, the pillars are entirely taken out soon after they are formed.

Collieries where pillars were worked out.

There are seven collieries where the coal pillars are being worked out; at all the other collieries the work is solely cutting out galleries. The foregoing does not fully apply to the Bengal Coal Company's Laikdi mine, where the seam is near to the surface, and nearly 100 feet thick.

Areas cut out.

There are now large areas cut out into galleries in various parts of the colliery district, many mines being almost completely cut out in this way. There appear to be only two courses left for these mines, and these are, either to begin working out the pillars, or abandon the mines when all the gallery coal is finished, and allow them to fill with water to the detriment and danger of neighbouring works and workers.

Skill required in working out pillars.

If the pillars are to be worked out, it will require much more skill, experience and care to avoid serious accidents than is necessary in gallery working; and I feel that I cannot express my belief too forcibly that a beginning to improve the qualifications of managers, and those immediately acting under them, cannot be made too soon.

As the mines are abandoned, the necessity for accurate mine plans and the difficulties and dangers following the want of these will be more and more felt.

Ventilation.

23. *Ventilation.*—This is a very important branch of practical mining, but there is scarcely any other branch that has been so much neglected in India; or that is so little understood by mining officials. The condition of some of the mines was disgraceful; they were about as bad in some parts as it was possible to be,—very little air, a steamy heat, full of smoke just like a chimney, and unfit to live in,—and all this without any apparent effort being made to ventilate the mines; in some cases the managers confessed that they did not know how to ventilate a mine. In one case, in a place where men were trying to work, there was no air to carry away the smoke given off by the kerosene oil lamps used, and the smoke was so thick that I could not see though I had a large lamp; then the lamp refused to burn, and I felt that I could not live many moments there, so I quickly retired. In other cases the whole mine was full of smoke, and I have left it with a headache and a feeling of exhaustion. The only explanations given were that there was no danger, the men had never complained, they expected to make it better soon, or they did not know how to improve it. They entirely overlooked the question of the people's health. Even Europeans come under this charge who ought to know better; and the natives say that they do just the same as the Europeans do. The shafts and inclines are connected by large galleries; and the galleries are cut and connected by large openings in all directions without the slightest provision for ventilation, or apparent forethought as to how it was to be done; though forethought, in the case of the ventilation, would mean a saving of money, by reducing the expense of stoppings and keeping the mine healthy.

Of all the collieries visited, only 6 used air-doors, 3 used brafticing, 9 had some air stoppings built, and 1 had an air-crossing. Only 4 had a furnace, or any apparatus used especially for the ventilation. And the quantity of air was measured at only 6 collieries, and some of these first began to measure the air after they heard that I should enquire about it.

Firedamp.

24. *Firedamp.*—It does not appear that firedamp has hitherto been very frequently found, or at any large number of mines; but all connected with mines should clearly understand that it has been found, has caused fatal accidents,

and is likely to be found, and very probably more frequently than hitherto. I have seen explosive gas in three Indian mines, and know of half a dozen other mines where it has been found during the last few years, and lives have been lost by it in some of the cases. This is such a very important matter, and one about which so very little is known by the mining people of India, that I make the following statements for their information and guidance, in the hope that they may, to some extent, check any tendency to carelessness or incautiousness when dealing with this dangerous gas.

**A caution as to firedamp.**

A very small quantity of an explosive mixture of firedamp and air will, if ignited, cause very great destruction and may cause great loss of life. Firedamp should be dealt with very cautiously, and with a knowledge of its properties. Wherever it is avoidable, firedamp should not be allowed to accumulate; when it is allowed to accumulate, the difficulties attendant on its presence and removal may generally be looked upon as increased at least a hundredfold. When a mixture of air and firedamp contains 9·38 volumes of firedamp in 100 volumes of the mixture, there is then just sufficient oxygen in the mixture for the complete combustion of the firedamp; this proportion is about the greatest explosive mixture, and a very violent explosion would be probably produced by the application of a flame at any point. But it has been experimentally demonstrated that when the mixture contains only 5 to 5⅓ per cent of firedamp it is highly explosive, and explosions have been obtained when the air contained only 4 per cent of firedamp. Then, air containing only about 5 cubic feet of firedamp in 100 cubic feet of the atmosphere, or 50 cubic feet of the gas in 1,000 of the mixture is explosive; and an addition of half this amount to an atmosphere in which the presence of firedamp can scarcely be detected, by the ordinary method of testing for firedamp, may convert it into an explosive mixture. The smallest amount of firedamp that can be detected in the air by the ordinary safety-lamp test is about 2 per cent, and this mixture may, by the addition of only about another 2 per cent of firedamp, become capable of propagating flame, and causing destruction and loss of life; but if the addition be 3 per cent of firedamp, the whole would be converted into a highly explosive mixture; and much less than that amount would, probably, before diffusion, form a very highly explosive mixture locally.

The effects of the ignition of the smaller and other percentages of firedamp may be greatly increased by the presence of dry and finely divided coal dust. It follows from this, that the practice of stemming up shot holes with coal dust, which I was sorry to find prevailing in a few of the Indian mines, is a highly dangerous one.

Firedamp is not regularly tested for in the Bengal mines; when it is found, it is generally by its having made itself known in its own rough way: this is what should be avoided as much as possible and at all times, and the object of testing for firedamp is to avoid an accident that might readily happen if its presence and position were unknown.

It is, therefore, highly probable that more firedamp has been and is given off from Indian coals, and that it has been present much oftener than has been recorded or known. It is also very likely, that the carbon-di-oxide given off by the strata; by the numerous kerosene oil lamps used; and from the workmen themselves; and the dense volumes of smoke given off by the lamps, coupled with the very feeble circulation of the air, which is often stagnant, has done much to keep down accidents from explosions of firedamp: such a foul mixture as that could hardly be expected to explode even though there was the necessary quantity of firedamp present to form a highly explosive mixture if the air was pure, or anything near approaching to purity. Sir Humphrey Davy found that if 1 part of carbonic acid were added to 7 parts of an explosive mixture, or 1 of

nitrogen added to 6 parts of explosive mixture, they would thereby be rendered inexplosive.

Explosion of firedamp.

A fatal accident from firedamp whereby six persons lost their lives, and which very forcibly illustrates several of the points upon which I have laid stress, happened on the 2nd June 1894, in a long, narrow, level gallery, down the Equitable Coal Co.'s No. 6 pit at Desherghar. It appears, from information I have received, that a very small quantity of firedamp was known to be coming off from the coal; and that the ventilation was temporarily stopped for a short time during some repairs; yet, the European in charge fully aware of all this, and in direct contravention of the manager's orders, proceeded towards the place, along with 5 other men carrying naked lights, without having first examined the place with the safety lamps provided for the purpose, to see whether it was free from explosive gas. While the ventilation was stopped, the firedamp, that under ordinary circumstances was diluted with the air to such an extent that it did not show in the air when tested for in the ordinary way, had accumulated and mixed with the stagnant air to form an explosive mixture; and this was ignited by the naked lights that the unfortunate men were carrying. The only apparent reason for the unfortunate man in charge acting as he did, appears to be, that he was utterly ignorant of the properties of firedamp and of its behaviour, and, therefore, he had not the slightest idea of what the real circumstances were or of the results that were likely to follow his action. I would strongly impress upon all who have to exercise any control in mines to get as full a knowledge as they can of the properties and behaviour of firedamp, otherwise, the truthfulness of the Indian proverb that "*The wise learn by seeing and the unwise by suffering*" will be exemplified to the fullest extent.

The wet nature of most mines may also have done something to keep down explosions.

Noxious gas.

25. *Other noxious gases.*—It does not appear that many of the Bengal mines have hitherto been much troubled by noxious gases, other than firedamp; for only two managers said they frequently had such gases present; and that it was principally carbon-di-oxide, which, in mining, generally goes by the name of carbonic acid, and is also known by the names of *stythe*, *choke-damp*, and *black-damp*.

26. *Plans.*—There are quite a number of mines where no plans are being kept of the under-ground workings; apparently there are only 36 of the mines visited where such plans are being kept; and a number of these, especially at some of the native mines, are of questionable accuracy. The surveyor is often a native who has had a short training in some school, but very little in practical mine surveying; and who, when he cannot show accurate work readily makes up for it by showing a certificate from a school in Calcutta. But I always found the native willing to learn, and able to do excellent work as far as he knows how.

The under-ground workings and plan of the surface were not always on the one plan, so as to show the relative positions of the different parts of one to the other; and when they were thus shown, it was often doubtful whether both had been reduced to the same horizontal measurements.

The direction, and the rate of dip was only shown in a few cases.

Little appeared to be known as to the errors and variations of the surveying instruments, and how to correct for these.

Scales of plans.

The scales on which the plans are made are fairly uniform, the principal are 40 feet, 50 feet, 80 feet and 100 feet to the inch.

The chain used for measuring in England is almost universally the Gunter's chain of 100 links or 66 feet; and the scales of mining plans are expressed in terms of the chain; 2 chains to the inch, and 3 chains to the inch being common. It appears that the measuring chains used in India for mining, railway, tea garden, and other surveys is 100 feet long. This is a very useful length, and as Indian mines are not very extensive, 100 feet to the inch would

appear to be a very useful scale for small mines, and general office plans, and some multiple of this, more or less for other mine plans.

Necessity of plans.

It appears to me to be unfortunate that an accurate plan of the workings of every mine has not been required and enforced. Pits are sunk, an area worked out into large galleries, no plan is kept, the mine is abandoned, and it fills with water; after that, the correct position of the old galleries and of the standing accumulated water is unknown, and cannot be ascertained. Then, to continue the process that goes on the adjacent coal has been, or is leased to other persons; they are either working it out or begin to do so, and the large volume of accumulated water under pressure, the position of which is not known, forms a standing danger of the very worst kind. This is a brief description of the actual way of working that is going on in nearly every coal area of Bengal. It is highly necessary that the exact position of the worked out parts of mines and standing water should be known.

Another very bad practice, but one of the most common in Indian mining, is to begin by working out the coal at the outcrop, and often letting in the ground there. This is downright favouring the surface water that can ever afterwards find easy access into the mine; and it does, as a matter of course, run into the mine, adding greatly to the difficulties and expense of working the mine, and to some extent it similarly affects all the mines on the dip side of it, and becomes a source of danger that has to be guarded against by leaving barriers of coal that will probably never be worked out but be lost.

Another matter as to plans is worth mentioning. The seams are generally thick and worked out in two or three or more vertical sections. There is often either some roof coal or floor coal left for a future time; and very often some roof coal is permanently left, and sometimes some floor coal. Now no attempt is made to show on the plan these various conditions of the working of the mine. If any part of the coal is worked out in a gallery, the plan is marked just in the same way as when the whole of the coal is worked out of a gallery, and gives no indication whatever of the proportion of coal worked out and left in.

Shafts and outlets.

27. *Shafts and outlets.*—Most mines have at least two pits and two inclines, or one pit and an incline, and some of them more than these. A few of the inclines are rather awkward to travel along; and some, along which coal is carried, are both slippery and awkward. The pits are round, oval, or rectangular; and the most common diameters are 10 feet, 12 feet, a few 14 feet and 15 feet, and one of 17 feet. The other sizes are 10 feet × 7 feet, 12 feet × 14½ feet, 11 feet × 14 feet, 11 feet × 13 feet, and 13 feet × 15 feet.

Sizes of pits.

Depths of pits.

The depths of pits varies between 25 ft. and 650 ft.; a common depth being between 200 and 300 feet, though there are several over 400 feet, and several under 100 ft. The upper portion of the pits are lined or secured by brickwork down to the stone-head, this being often about 25 feet from the surface; below this part the natural sandstone rock forms the sides of the pits. This rock is mostly solid and seldom requires additional security, but it allows water to find its way into the pit; and it should often be carefully examined not only to see that the rock itself is secure, but to see that there are no loose pieces of coal, stone, brick, or wood in positions from which they can readily fall down the pit on the persons heads. I have often seen these things in such dangerous positions. The positions of the pits and outlets are, in nearly every case, such that if an accident happened to one, it would not affect the other, but leave an available outlet from the mine and a means for the air continuing its circulation: but the means available for winding persons out of the second outlet were sometimes wanting. A few of the mines have no second pit or outlet, and the machinery at the one is not good; the ventilation stagnant, the galleries were full of smoke, and I did not think they were fit to live in. There is a steam-

pump at the bottom of most pits, but, on inspecting at several of them, I found the pumps stopped, water pouring down the pit on both men and women who were wading in from 12 inches to 18 inches of water that was on the pit bottom and in the entrances to the galleries ; and I had to adopt some curious stratagems to avoid being plunged into the water and having also to wade in it.

Travelling into the mines.

Persons enter and leave the mines by travelling along, in some cases climbing along inclines, by riding in pit cages, and in iron buckets. Females appear to object greatly to riding in buckets, and do not like to climb into and out of them. At most mines, persons are allowed to carry tools, tokris, etc., with them up and down the winding pits; this is bad.

How mineral is brought out.

The mineral is brought out of the mines by boys, girls, women, and men carrying "tokris" or baskets full on their heads and along the inclines; each tokri holding from half to one maund or nearly 100 lbs. weight. There appears to be a great deal of unnecessary carrying done at most of the mines both on surface and below ground. The coal is carried to the wagons when the wagons could be much more easily, and often more cheaply, be taken to the coal. I saw coal being regularly carried on women's heads below-ground for all distances up to 1,000 feet ; and this at a "European" mine where labourers were said to be scarce and in great demand ; and although tubs or trams and tram rails would have enabled the coal to be brought out with about one-third of the labour.

Carrying coal much more than is necessary.

Using trams where tram rails were not provided.

A few of the mines take advantage of the use of trams and tram-lines; and in one mine where trams had been provided, but not tram-lines, I saw the trams being regularly pushed on the hard floor from the pit bottom to the working face, a distance of about 200 feet, most of the distance being on a slight incline. This was being done to save the greater labour of carrying the coal on their heads in tokris.

At a few of the mines there are self-acting planes below ground, and also steam engine haulage ; and at three collieries ponies were being used to haul along the trams on under-ground levels and planes. Other means of bringing out the coal from the mines are, by steam engine, with wire ropes, hauling gangs of trams from the mines up inclines ; steam engine winding trams up pits in cages, and also winding up iron buckets holding about 6 to 8 maunds of coal. Coal is also wound up in iron buckets by means of gins and wire ropes. The gins are worked by females, from 20 to 28 females, at a gin or 5 to 7 at each of its four arms. Another way that is mostly practised at sinking pits, is to have the smallest possible amount of head gear, namely, two upright or slanting poles sunk into the ground, with a cross-piece near the top, a pulley from 8 inches to 12 inches diameter fastened to the cross-piece by rope or chain, a small basket or small bucket and a hemp or wire rope at which from 20 to nearly 40 females pull as they walk merrily along the ground to a distance equal to the depth of the pit.

Enginemen, and boilermen or stokers.

In most cases the enginemen who have to wind people up and down the pits are selected with some care; and appeared to be persons of mature age, careful, and experienced. But in at least one case this did not apply, the engineer being quite a boy. The same, but to perhaps a less extent applies to the boilermen or stokers. If these men show themselves to be careful and intelligent, they ultimately get promoted to enginemen, this appearing to be the natural channel from which the new enginemen are drawn. I met with a few cases of careless and negligent stokers ; and one flagrant case of overweighting of the safety-valves.

Fencing tops of pits.

28. *Fencing tops of used shafts and side entrances.*—I found many pit tops and side entrances that were quite unfenced, and in a very dangerous state; both Europeans and natives being offenders in this respect. But I had the satisfaction of seeing most of them securely fenced.

Fencing of unused pits.

29. *Fencing tops of unused shafts.*—I found unused and unfenced pits at many of the collieries, some of which were secured forthwith. The various ways of fencing these pits are by brick walls; mud walls; heaps of refuse; timbering or bamboo; wire fencing; and growing Moruber, a kind of long and broad leaved prickly plant, round the top of the pits. I frequently came across an old unused and unfenced pit, sometimes quite close to a cartroad or footpath, and in a very dangerous position. The wonder is that many people have not lost their lives by falling into these pits, and that the authorities allow such dangerous holes to remain in that state. I have heard rumour that more lives have been lost by falling into pits, both children and adults, than is generally recognized. Steps should be taken to have all unfenced pits secured forthwith.

Dangerous old pits.

Urgency for fencing old pits.

Signalling.

30. *Signalling.*—The most common mode of signalling in India appears to be by shouting, though at a few the wire and rapper, and even electrical signalling was in use. Signalling by shouting is about the only system in use at sinking pits. At a few pits an iron plate or a piece of railway metal was used as a gong, both at the bottom and top. Although there were understood codes of signals at many mines, there were only a few where they had a proper code posted up for the information and guidance of those who had to do the signalling.

No Codes of Signals.

Ladders.

31. *Ladders.*—Ladders are only used for getting up to the work in thick seams, and a few other similar purposes below ground. In a few cases I found defective looking wire rope ladders in use in pumping pits to enable a man to go to the pumps.

Chains.

32. *Chains.*—I did not find any actual case of chains being used, instead of ropes for lowering and raising persons in pits; but I visited one pit where chains were just about to be used for that purpose. The owner promised to get new wire ropes before beginning work. There are several mines where chains are used instead of ropes for winding coal.

Places of refuge.

33. *Places of refuge on incline planes.*—I generally found an ample provision of these necessary places. The galleries driven out from the sides of the planes also serve very well for places of refuge, in which to go out of the way of the running gangs of trams, and occasional runaway trams.

Machinery.

34. *Machinery.*—In the majority of cases I found the machinery fenced where that was thought to be necessary; at some mines it was not fenced, and in a few cases it was fenced as soon as I called attention to the necessity.

Winding ropes.

The winding ropes are round, made of wire, said to be steel, generally looking to be in good condition, and of apparently adequate strength. Some are made with Lang's lay, some are bought from Calcutta firms, and others have come direct from a few of the best English makers. I found a few bad ropes being used for winding coal.

Injury to ropes.

The small, and the very variable sizes of the pulleys and drums in use, does a great deal towards making the average life of the winding ropes to be about as variable as it can possibly be. Other causes are pulleys on the twist, and wabbling in the bearings, iron drums without timber lagging, lagging badly done and in bad condition, and one coil of rope coiling and grinding on the next below it.

Breaking of winding ropes.

I find that occasionally a winding rope breaks though the actual working load as compared with the actual strength of the rope when new is very small. In most cases, the factor of safety appeared to be not less than 10, a number that is generally recognized as sufficient.

Brakes.

The winding is generally slow. At all the pits where persons ride, except at about one, there was some sort of brake to the winding engine; but it was generally on the fly wheel, and not on the drum shaft where it ought to be. When the brake is not on the drum shaft, it is no use at all at the time of an

accident to the spur gearing, the time when it is most wanted, and the only thing then to depend on to prevent loss of life or destruction of property. There should always be an adequate brake on the drum shaft. One curiosity is the case of the engineman and his levers on one side of the cylinder, and the foot lever of the brake on the opposite side of the cylinder, with a man to put the brake on and take it off for the engineman. Another novelty is strap-gearing with loose and fast pulleys for winding coal up pits; I found about two engines fitted like this.

Should always be a brake on drum shaft.

There are a few detaching or safety hooks in use at "European" mines.

Cages, etc.

Where cages are used keps, kebs, or catches for supporting the cage whilst banking, are in general use; also a cover or bonnet on the cage.

Cage guides.

Wire rope guides are those mostly used in cage pits; in some pits the guide ropes are made for the purpose, of very thick wires; but at other pits, old winding ropes are used for the purpose. Some of the guide ropes are fastened at the bottom, and have a regulating screw on the top; others are weighted at the bottom; the latter method is probably the best, but not when the weights are fast on the bottom as I saw some, then they are useless.

Boilers.

The steam boilers come under the Act for the inspection of boilers and prime movers, and they are thoroughly inspected once each year by a Government Inspector; and a yearly certificate is granted showing the maximum pressure at which they are to be worked. The boilers are also, apparently, frequently inspected by the colliery people when the boilers are being periodically cleaned. They have nearly all the ordinary and necessary boiler fittings; but some of the fittings, the pipe joints and other junctions, were in anything but a good condition.

System of lighting below ground.

35. *System of lighting.*—Naked or open lights from oil lamps are used in all the mines in Bengal. The lamps are of many sizes and shapes, the majority being made of tin plate. Rag and stick torches are adopted for occasional use.

Lamps.

Oils used.

Castor oil is used at all the East Indian Railway Company's mines at Giridih, and is burned in shallow earthenware vessels with the lighted end of the wick hanging just over the edge; and to make the lamp complete and convenient, the work persons attach an elegant wire handle to support the oil vessel. Castor oil gives off very litte smoke as compared with the smoke given off by kerosene oil, which is the oil used at almost every mine other than the above. Kerosene oil is a dirty smoky oil, but very cheap as compared with castor oil. It ought to be compulsory to use a cleaner oil than kerosene where the ventilation is not sufficient to keep the galleries almost clear of smoke. Many galleries, in some cases the whole mine was rendered absolutely foul and unfit to live in by the smoke and soot from the kerosene oil used.

Kerosene oil smoky.

Kerosene oil should be prohibited where ventilation is insufficient.

Blasting.

36. *Blasting.*—Blasting in the coal is not much practised. There are only 3 collieries where explosives are used to blow down the coal. Altogether, I found that explosives are used in 14 mines or collieries. The explosives used are "country gunpowder"; dynamite; safety fuze, generally the commonest kind; detonators; and "electire fuzes." Various materials are used for stemming, and at 2 collieries coal dust was used for stemming. This cannot be too strongly condemned. At one colliery, copper or brass tipped stemmers or ramrods are in use; at 6 collieries they use wood stemmers; and at 10 collieries iron stemmers are used. The use of iron stemmers is a very dangerous practice; as is also the "unramming" or withdrawing of the explosive charge when a shot has missed fire, but it is a practice that I was sorry to find to be rather common. There is too much carelessness and ignorance displayed in the matter of charging shots; charges that have missed fire; and in the handling, temporary storage, and carrying of explosives into the mine. "Country gunpowder" is a very inferior explosive, though it appears to do its work well; it is slow burning, and gives a very large proportion of solid carbon as a residue. It does not appear to be so readily

Explosives used.

Coal dust used for stemming.

Iron stemmers.

Unramming shots.

ignited as English made powder; and this may be one of the principal reasons why the use of iron stemmers, and the unramming of shots has not caused more accidents. The common fuze that is used burns right through to the outside, becoming temporarily one mass of heated substance, which probably accounts to a great extent for the regular running of the fuze, and the missed shots being fewer than would be expected.

How explosives are taken into mine.

Some of the ways of taking the explosives into the mine are,—carried in the hand when in the form of cartridges; in leather, and in cotton cloth bags or sheets; in wood boxes; and in old kerosene oil tins; some of these are sometimes carried in the hand, and at other times in a tokri. When dynamite is used, the cartridges are prepared on the surface by fixing the fuze and detonator into the cartridge; and the charge is taken into the mine in that highly dangerous condition. Though the danger of this practice is acknowledged, the managers apparently believe that it is less dangerous than having the charges prepared with much less light, and under much more unfavourable circumstances in the mine. Shot firing in the mines is generally carried on promiscuously, there being no question as to whether the ordinary work persons are in or out of the mine.

Timbering.

37. *Accidents, etc.*—Where the roof is insecure, and requires to be timbered, special timber or carpenter "mistaris" are generally employed by the owner or contractor for the purpose. In the mines, as well as on the surface "it is every man to his own trade, sir"; and the miners and others will not assist in this work, much less do it for themselves: though I have been informed that at one colliery the getters are gradually being got into the way of rendering a little assistance in the timbering of their own working places. The timber mistaris work under the control and directions of the sirdar, or contractor, or overman; and when directed to go to a place to secure it they take 2 or 3 assisting coolis with them and these get the timber to the place. The mistari often thinking it beneath him, and a violation of caste to assist in carrying or getting things about. When the timber has been got to the place where it is required to be fixed, the mistari takes a measurement of the length required, and then squats down on his heels and proceeds to deftly cut the timber with a kind of axe, not a saw, into the length he wants; and in this way they will succeed in fixing a few timbers during a working shift, a feat that one has often seen performed in England within an hour's time. Fortunately, and principally owing to some strong coal being generally left as a roof, not much timbering is required in many of the mines.

Coal getters do not timber their places.

Scarcity of timber.

Timber is very scarce, and, consequently, very expensive, so that the use of it is avoided wherever it is possible to do so. The kind used for underground purposes is "Sal" wood, which appears to be very suitable when the "látis" are not too thin. The used sleepers discarded from the railways are also much used for pit timbers, and are very serviceable. Railway metals again are much used at mines, as would be expected where timber is expensive; but their use is almost confined to the surface, where they are used for nearly everything, from headgears downwards. Other timbers used for construction are "Teak" and "Pitch pine." With the exception of a few mines, the carpenter mistaris do not appear to have learned the art of fixing the timbers properly and to the best advantage: there is much room for improvement in this respect.

Timbers not properly fixed.

Timber kept on surface.

The timber to be used below-ground is mostly kept on the surface, very little is kept in a convenient place below-ground; but then, persons are supposed to cease work and leave any dangerous place; and it is said that a better choice of suitable timber can be provided on the surface, and that distance, and time are matters of little concern to the cooli.

Accidents.

The particulars of accidents that have happened in and about mines appears to be the least successful part of my inquiries; but I trust the time will soon come when all serious accidents will be forthwith reported to the Inspector of mines, so that he may have an early opportunity of inspecting and inquiring into the cause and circumstances on the spot, with a view to preventing a recurrence. It appears that under the present arrangements, if an accident is

Reporting accidents.

thought to be sufficiently serious, it is reported to the police authorities, who forward the information to the divisional or sub-divisional officer; the police inspector makes some inquiries, and occasionally an inspection of the place of accident; and if it is thought that some one is to blame for the accident, the Divisional Officer puts the persons on trial and takes formal evidence in court.

Classification of causes of accidents.

The causes of all serious accidents about mines should be carefully ascertained and classified, so that the causes of the most frequent accidents can be brought into view. This would give an opportunity for paying special attention to the most frequent causes of accidents, and the rise and fall of the greatest dangers could be watched, and comparisons, if found necessary, could be made. With this object in view, I offer the following suggestive way in which the reported accidents might be classified, and should be very glad if divisional officers could see their way to adopt the suggestion.

*A proposed classification of accidents that are reported as being fatal, or of a severe or serious nature.*

| Date. | Hour. | Hour of person's shift. | Name of the mine or colliery. | Where situated. | Name of the owner or company. | Name and number of persons killed. | Name and number of persons injured. | Reputed age. | Occupation. | Cause of accident. | Remarks on cause of injury or death. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | BELOW GROUND. | |
| | | | | | | | | | | Noxious gas. | |
| | | | | | | | | | | Fall of roof. | |
| | | | | | | | | | | Fall of side. | |
| | | | | | | | | | | Fall of coal in working place. | |
| | | | | | | | | | | Overwinding. | |
| | | | | | | | | | | Ropes or chains breaking | |
| | | | | | | | | | | By machinery whilst descending or ascending. | |
| | | | | | | | | | | Falling down shaft. | |
| | | | | | | | | | | Things falling down shaft. | |
| | | | | | | | | | | Miscellaneous in shafts. | |
| | | | | | | | | | | Explosives | |
| | | | | | | | | | | Irruptions, or falling into water. | |
| | | | | | | | | | | On inclined and engine planes. | |
| | | | | | | | | | | By trams or tubs. | |
| | | | | | | | | | | Machinery under ground. | |
| | | | | | | | | | | Sundries under ground. | |
| | | | | | | | | | | ABOVE GROUND. | |
| | | | | | | | | | | By machinery. | |
| | | | | | | | | | | Railway sidings at mine. | |
| | | | | | | | | | | Miscellaneous on surface. | |

Suggested descriptions for "Cause of accident" column.

Medical attendance, etc.

It is a pleasant task to record the fact that at all the "European" collieries, doctors, medecine, and surgical appliances are kept ready for use in case of sickness or accident. This is an excellent provision that appears to be quite absent at the native collieries, who depend almost entirely on the local doctors; bazar or "Shaw Baboo" for medicines, and any help it is possible to get from the Europeans, who they find always ready to help in times of need. The European mine owners have also European doctors who pay periodical visits of inspection, and see that the native doctors are properly equipped and doing the work properly; and they are ready to attend at any time, with very short notice, if required. Provision is also made in the way of money allowances to persons who are unable to work through accident. And at Giridih, excellent and ample hospital accommodation is provided. Special ambulance stretchers do not appear to be as much a necessity here as in Europe. The native bedstead or "chárpá, i" is very much like an ambulance stretcher and is often used for that purpose in fact, it is the recognized article; there are always plenty available for use, and the natives know how to handle this useful apparatus.

First aid to the injured.

But over and above all this, a step more in advance can well be taken in the way of "First aid to the injured and sick" to be ready and to know how to render timely assistance, to stop excessive bleeding, to put a person out of immediate danger; to remove the injured in the best way without making, by over anxious but injudicious handling, a simple injury into a very serious one, as for instance, causing a simple fracture of a limb to become a compound fracture with great danger to life; to save life when neglect of the necessary precautions, or listless fear would prove fatal; and what is not of the least importance, to know when and how to get the doctor to the person with the greatest dispatch and least delay. First aid appears to be much more necessary here than in colder countries, because mortification appears to set in earlier, and more readily, many very slight accidents end fatally; and the people are less able constitutionally to stand the shock and strain on the system, or to supply the necessary vital energy for overcoming their effects.

First aid more necessary here than in colder countries.

Knowledge of how to render first aid recommended.

I would earnestly and strongly recommend all those connected with mines, and others, to become able to render suitable first aid. A system of giving first aid and avoiding delay has already been established at the East Indian Railway Company's collieries at Giridih; and I believe it is being established on the railway line by their eminent medical man Dr. H. H. Bathe. At the above colliery the Native Sirdars can now staunch bleeding of femoral and brachial arteries with improvised torniquets, a "pugri" and a short stick or stone. I have seen them show their skill in this respect, and it shows what a native can be taught to do. A person injured in the mine is first removed from danger, suitable first aid given, and the person made as comfortable as possible, after that he is only moved from the mine under the care of one of the medical men, who are required to go *into* the mine immediately on being informed of an accident. The Company has provided 3 accident, or first aid boxes completely fitted for all temporary requirements.

St. John Ambulance Association.

The St. John Ambulance Association, of St. John's Gate, Clerkenwell, London, E. C., has, and is rendering most valuable help and instruction in almost all parts of the world, but more especially in England, and I sincerely trust that before long we shall have centres and branches of this most useful and benevolent Institution in full working order all over India. As to the need for firs aid, let me quote the Association's words.

Need for first aid.

"The needless suffering so frequently caused by the ignorance of unskilled persons is as undoubted as it is deplorable. By rough handling, or even the mere want of the slightest knowledge of how to support an injured limb, a simple fracture may be made compound, or even complicated. The method of

arresting bleeding from an artery is quite easy, yet thousands of lives have been lost, the very life blood ebbing away in the presence of sorrowing spectators, perfectly helpless because none among them had been taught one of the first rudiments of instruction of an ambulance pupil—the application of an extemporised torniquet. Again, how frequent is the loss of life by drowning, and yet how few persons, comparatively, understand the way to treat properly the apparently drowned." "The value of first-aid appliances depends almost entirely on the rapidity with which they can be obtained, and in case of accident the benefit of a complete ambulance outfit on the spot is incalculable. Such outfits should be kept in accessible places, not only in mines and at factories, but in every important thoroughfare in the kingdom." I shall be glad to give any help or information to any one willing to act in this matter; and I strongly recommend the perusal of a pamphlet to be got from the Association entitled "Facts and figures connected with first aid, specially addressed to managers of mines and collieries."

Direction of miners in their work.

The persons are directed as to their work in the mines, and shown the places where they may work, by the Sirdars, whose principal duty that appears to be. The Sirdars again act under the overman, or the manager, but he has the immediate control and direction of fixed gangs of workmen.

Experience required of coal getters.

No experience is required of any person before he is engaged as a coal getter; all are readily accepted that come. But with a new man, the precaution is supposed to be taken of putting him to work with a gang of experienced miners, and if he is a new hand at the work the miners make him pay them for his learning, and they also sometimes have an allowance from the owner.

Accumulations of water.

There are 24 collieries that have accumulations of standing water in old works near to them. The positions of some of these old works is properly known, and the necessary precautions are, apparently, being taken. But there are some old workings full of water, and dangerously near to present working mines, whose correct position is not known, there having been no accurate plan kept of them. Some of these may be looked upon as a constant source of danger.

Surface property.

There are 18 collieries that have valuable public surface property on them, such as railways, public roads, bungalows, temples, large public tanks, villages, etc.

Health of the people.

From the information I was able to get, the health of the people in colliery districts appears to be quite equal to that in any other district; and, with the exception of occasional outbreaks of cholera and fever, it may be said to be good.

Provisions for food, clothing, and drink.

There is ample provision in all the colliery districts of Bengal for the native miner and his wife spending their earnings to advantage in food, clothing, and grog and tobacco as luxuries. There is a very large and splendid bazar held every Sunday at Giridih, at which it is said at least 30,000 persons attend in one day. It was provided by the East Indian Railway Company, and is superintended by them, but it may be looked upon as a public institution, there being no restrictions as to persons. The Bengal Coal Company, Ld., have also provided a very splendid bazar near their Sanctoria Colliery, and business is done there by crowds of people twice weekly. The Equitable Coal Company, Ld., have also provided bazars, for their workmen. Then the bazars at Barakar, Sitarampur, Asansole, and Raniganj serve for other parts of the coal field as well as numerous small bazars and shops in most parts of the district.

Drinking water.

The question of the water that the people drink is a most important one. An ample supply of good water is the greatest necessity of the native without exception; and the foul water they sometimes drink is probably the greatest cause of all the ills the native is subject to. Most colliery owners make an

effort to supply sufficient good water either by tanks; the water pumped out of the pits, which is most often good; by sinking wells; and by pipes and hydrants; or by all these methods. Some companies regularly spend a great deal of money on the water supply. But it is not enough to pump good water into a tank where the people drink, bathe, wash clothes, and water cattle; but it requires to be cared for, and kept in a clean and good condition. When the tanks had become nearly dry at the end of the dry season, the filth then displayed at the bottom of some was foul indeed; and suggested the thought that they had not been cleaned out as often as they ought to be, or as health requires. I commend this question of clean water to all managers as being not only a question of health but of economy; in this respect it bears some resemblance to first aid to the injured; for when a workman dies, or is on a bed of sickness, or off work from injury, it is, during these times of scarcity of labourers, a daily loss to the colliery that employed him.

Tanks not often enough cleaned.

Rules and discipline.

38. *Rules and discipline.*—As to rules in force for the regulation of the mine, for the prevention of accidents, and for securing proper discipline, there are few of the mines where there are such rules, except such unwritten rules as are in some way understood to be the requirements of the manager and other officials. There are only 4 collieries that have written or printed rules, so that it is greatly to the credit of all the mining people that the working and management of the mines goes on so well as it does.

Notices.

It appears that the colliery owners have no objections to any legislation requiring notices to be sent to the Inspector of mines of the commencement of any working for the purpose of opening a new shaft or a seam of any mine; of the abandonment or discontinuance of the working of a shaft or seam; of recommencing to work a shaft or seam; and of any change in the name of the mine, or of the higher officials.

Yearly returns.

There would also, it appears, be no objection to supplying a yearly return, with particulars, of the persons ordinarily employed above and below ground, and particulars of the time worked, and the minerals raised.

Schooling.

39. *Schooling provision.*—Schooling for children appears to be a very debatable question in India, about which there are many differences of opinion, especially in colliery districts. I received information of schools at 3 collieries, 2 sets of schools received Government aid; and I also heard something of 11 village schools. Those who are opposed to the education of colliers' children, say, that in the children's own estimation they would be raised above their station even by a little reading and writing. After that, they would look down with scorn on working in mines, the work of their fathers and mothers, and would not work in a mine, nor at one, except as a "Baboo." In other words, and in brief, that even a little education would unfit a boy or girl from working in a mine. On the other hand, those who favour the children's education say, that it does not unfit them for any work in mines, but that it makes them into more intelligent workers, and such that are able to cope with the cheating and cunning of the shopkeeper, and the money lender. And the manager of one of the largest and most successful collieries in Bengal is a strong believer in children's education, and has been practising his belief for a great many years by establishing a great number of schools, and having hundreds of children educated therein; and the result has so far been highly favourable. Education, and systems of education can be used like a two-edged sword cutting both ways, and it is hard to believe that it is the mere learning to read and write, or being able to do this, that has a bad effect. Is it the system that is defective; does the very badly paid "baboo" teacher put bad thoughts into their heads when he should be teaching them what is good. Could not a good teacher, if enough

Education of miners' children.

was paid to support one, do much to make learning to be a valuable thing rather than a disadvantage. Then, again, one might guess with some degree of certainty that when the majority of the children go to school, one educated child will not be much superior to another, so that the most clever or hardest worker will take the lead, as he deserves to do, the others will feel comparatively as low as ever, and begin work in the mines as soon as they can. The most intelligent will be required, as they are required now for skilled labour in the workshops, at the engines, and other machinery, superintending work, and as under-ground sirdars who will be able to write their own reports of inspections made. Complaints have been made of the expense of bringing out Europeans as officials, and of the difficulties of getting suitable men "from home," yet objections are made to train boys to become what they want them to be, able to read and write, and understand the work of mining. There is already room for plenty of these.

Skilful and intelligent boys now required.

May I suggest that even the lowlynative boy and girl should be taught, how to properly see, hear, and speak, to understand a plain and simple question and to give a direct answer to a question when asked; and that everybody would benefit by this. Under the present condition of things, an answer to the point cannot be easily got even to the plainest and simplest question. And this sometimes applies even to managers; it is often very difficult to get direct answers from natives; but a European manager gave the number of females employed in answer to a question requiring the age of the oldest woman employed. Could the children, in addition to reading and writing, receive a little elementary technical training that would tend to fit them, and not unfit them for working in mines, but something that would be of use to them when they boldly and heartily go forth to put it into real practice as workers in mines. This training might include, for instance, things about tubs or trams and their uses; tools used in mining, the best kind, and use, and the reasons for their particular shape; and how to avoid dangers in many ways. This would at the least teach them the disadvantages of carrying coal to trams and wagons when the trams and wagons could so much more easily be taken to the coal; it would do much to break down prejudices as to ways of doing work, and make them see the folly of filling a barrow, and then carrying the barrow and load on the head, because their forefathers had never wheeled a barrow: examples of this kind have been related to me. *All this is offered as suggestive; opinions change with more mature experience.*

Technical education.

Adult schooling is necessary on some of the most important branches of practical mining, as, for instance:—

Adult technical training.

Timbering.
Mine gases and ventilation.
Explosives and their safe use.
Safety-lamps, their use for lighting and testing.
Means for securing general safety.
How to render suitable first aid to the injured.

It does not appear that it should be difficult to arrange for such instruction being periodically given at a selected number of mining centres. The instruction should be of a practical character, with just sufficient theory to explain the principles. Too much not to be attempted at one time; a little at one time, and that done well, should be the guiding principle. A select set of suitable but simple models and apparatus, for illustrations and experiments, would add greatly to the value of the instruction.

40. I have obtained a large quantity of information and facts for reference that is not included in this report.

For reference.

*Precautions which should be laid down generally for the protection of miners against accidents.*

A special report.

41. In February of this year, the Government of India asked me "to report on the precautions which you think should be taken in every mine in India for the protection of miners against accidents."

The following is a copy of the report submitted :—

REPORT.

No. 39.

*March 8th, 1894.*

DR. WILLIAM KING, B.A., F.G.S.,

*Director, Geological Survey of India.*

SIR,

Report.

In compliance with the instructions of 19th and 23rd February, to submit by the 15th of March, a supplementary note on the precautions I think, "should be taken in every mine in India for the protection of miners against accidents", I have the honour to report as follows :—

1. When it is borne in mind that nearly the whole of the English Mines Act is an elaborate system of precautions for protection against accidents, and that hitherto the accidents in India do not appear to have been collected at one centre and classified as to their causes, it will be evident that for the purpose in view, I have not the advantage that a good classification of the causes of accidents in India would have afforded, and shall therefore have to rely, to a great extent, on my English mining experience, and what has been found to be necessary in the United Kingdom as set forth in the English Mines Acts and Special Rules.

There are some dangers an Inspector meets with that are obvious, unquestionable, avoidable, and inexcusable, as for instance an unfenced pit in such a position that people are regularly and closely passing it both in daylight and in the dark: and there appear to be a great many of these. There should be no delay of half-heartedness in having this source of danger remedied. Dr. Saise, the eminent Manager of the East Indian Railway Company's Colliery at Giridih, recently informed me that in the early days the chief accidents were by falling down pits or shafts. Now, the chief accidents are from falls of roof and coal at the working faces, getting an easy bit of coal off a pillar, and going into dangerous places to steal a bucket of coal. Surface accidents, from being run over on the tramways, and by runaway sets of wagons on tramways or narrow gauge railways.

2. It appears to me that these and numerous other sources of accidents could be best dealt with by special rules framed by committees elected by, and from, owners, agents, and managers of mines, with the Inspector of Mines as representing the work-people and the Government. This would be practically the system under which the special rules in the United Kingdom have been framed; and it would probably be the easiest and most effective way of getting the best set of regulations for any series of mines that have most things in common; and at the same time creating a feeling amongst the mining community that they have got what is best, and what it is their duty, as well as the law, to observe.

The special rules would be for the conduct and guidance of all the persons acting in the management of such mines or employed in or about the mines as, under the particular state and circumstances of such mines may appear best calculated to prevent dangerous accidents, and to provide for the safety, convenience, and proper discipline of the persons employed in or about the mines.

3. It appears also that it would first be necessary to pass a short, carefully prepared, and clearly worded Mines Regulation Act for India, which, amongst other things, would provide for the establishing of special rules which would have the same legal standing as the Act itself.

I think the Indian Mines Act might well provide also for :—

(1) The age below which boys and girls should not be allowed in mines, say 10 years for boys and 12 years for girls.

NOTE.—Every one should, as far as possible, be able to take care of himself or herself in mines. It is most often the case that the greater the number of persons idling about the greater the noise and inattention; whereas, silence, attention and care are often the most essential things, and the greatest precautions against accidents, as for instance in the working out of pillars, and where timbering is being drawn out.

(2) The foregoing restriction will make it necessary to provide for a register being kept at the Colliery Office, of name, date of birth, date of first employment, and perhaps place of residence, of all boys, girls, and women as far as possible.

(3) Provisions as to fencing and securing of shafts and outlets.

(4) As to managers, and supervision. Three important factors in the safe working of mines are competent management, adequate supervision, and the best system of working. The system adopted for the working of a mine having much to do with its safety.

(5) *Plans.*—Accurate plans are a necessity, and record plans of abandoned mines ought to be required.

(6) Notices should be required to be sent to the Mines Inspector of commencing, re-opening, discontinuing, and abandoning of mines.

(7) Powers and duties of the Inspector of Mines.

All serious accidents should be reported to Inspector, and be classified as to their causes. He would inspect and investigate where thought necessary, and take such other steps as he should think to be best to prevent a recurrence; and those causes under which most accidents came could receive special attention with a view to prevention.

(8) Provision as to ventilation.

(9) The use of explosives. This is important, and the necessity for early legislation thereon is apparently clear.

(10) As to workings approaching dangerous accumulations of water, or noxious gas.

(11) Prohibition of single link chains where persons ride.

(12) Fencing of dangerous machinery.

(13) Recommendation as to ambulances, etc. An injured person should receive suitable first aid as soon as is reasonably practicable, and should be conveyed from the mine in the way best suited to the case. I believe this is now being done at the East Indian Railway Company's Collieries.

(14) Carefully drawn up definitions of the terms used.

(15) As to publishing the rules, and the languages in which they should be published.

(16) Penalties, etc.

Special rules.

4. The special rules might comprise the following, the most generally applicable of which would become part of any future Mines Act.

(1) The inspection and reporting as to safety of all under-ground working parts of the mine. It appears that the general minimum that safety requires is one thorough inspection each shift by a competent person, European or Native, appointed by the owner, Agent or Manager for the purpose. In some mines, or parts of mines, the minimum should be an inspection similar to the above immediately before the commencement of each shift, and once during the shift; as, for instance, in mines giving off noxious gases, in pillar workings, or other specially dangerous working.

In all cases a true report of the condition of the mine as to safety should be recorded for each inspection. Each such report to be signed in the handwriting of the person inspecting, and, where possible, the whole report should be written by him. All report books to be provided by the owner.

I believe that a rule based on the foregoing would be a very important precaution against accidents.

(2) All machinery, ropes, chains, etc., should be inspected as to safety, and reported on, as above, once at least in every 24 hours; and also the shafts by which persons ascend and descend, and all belonging to them.

(3) The requirements as to shafts in use, and where persons ride in them, should include—age and competency of enginemen, attendance of enginemen during whole time that persons are below ground, not to leave engine whilst winding persons, nor allow any one to handle engine without proper authority.

There should be an adequate brake on the drum shaft, suitable indicator to show position of cage in shaft, proper signalling appliances, and suitable code of signals.

Pit top and side entrances to be kept fenced, cage, and about pit top, to be kept clean and free from coal and other loose material. Persons to keep from under pit, especially when banking is going on, or the cages or buckets are in motion in the pit; and not to ride outside or on top of cage or bucket, except under special circumstances. There should be a cover overhead; also a handle in cage to hold on by. The number to ride at one time; not to ride in opposite cage or bucket to a full load; not to carry tools, etc., down or up with them, nor on the same cage bottom; not to get into, nor out of, cage or bucket when in motion. Pit to be in charge of a banksman at the top and hooker-on at the bottom during the whole time that persons are allowed to ascend or descend.

(4) The securing of roof and sides of all working and used parts of the mine, or parts for the time being in use. This is very important, and want of proper and sufficient precautions in this respect is probably the cause of more accidents than anything else. There should be an adequate number of competent persons to do this.

An ample supply of suitable timber should be constantly kept in a suitable and convenient place at the mine. In addition to the examination by officials, every person should, both before commencing and whilst at work, frequently and carefully examine his own working place and see that it is safe in every respect. And if he at any time finds it unsafe, or has cause to fear danger, he should either take steps to make it safe, or forthwith leave the place and report the danger to the person in charge of that part of the mine. All dangerous parts whenever, or by whom found should, if not immediately made safe, be reported to the officials in charge, and to all persons who are at all likely to go into that part of the mine.

All overmen, sirdars, contractors, or other officials should be empowered to stop any work they may consider dangerous, whether the work be in their immediate charge or not, and to report the case as soon as possible to the person in charge.

The timbering as to kind, general position, distance apart, etc., should be fixed according to some general rule as set forth from time to time, in writing by the Manager, as being in his opinion the most suitable for the existing conditions. It should be properly set, and suitable for the purpose.

The drawing out of timber, dropping roof coal and pillars, or any such work as is likely to cause a heavy fall, or much disturbance of the strata, should when possible, be done when the mine is clear of labour. It would be well also to restrict this work to the time when there should be two competent Europeans present, or one European and an equally competent Company's Native servant; it being a first rule in all cases that these persons shall be able to understand and talk with each other, so as to advise and give immediate warning of impending danger. There should be some restriction as to the number of persons, especially children and females, present in pillar-working, when timber is being drawn out, or other dangerous work is being done. See previous remarks on this.

(5) All entrances to parts of the mine which are not in actual use, or not regularly inspected and kept in a safe condition, should be kept fenced acr[illegible] whole width of the entrances, so as to prevent persons inadv[illegible]tl entering the same.

(6) Regulations as to use of ladders; and ladder ways in shafts w[illegible]ere shaft are also used for winding material.

(7) The use of safety lamps where there is likely to be firedamp.

(8) Signalling, and manholes or places of refuge on under-ground in[illegible]nclines alon which wagons move and persons travel. Regulations as to t[illegible]ravelling an being in, or at the bottom in front of such inclines when th[illegible]e wagons ar in motion. And also for surface tramways at mines, as to use of brake stop blocks, signalling, riding, and securing wagons on incl[illegible]nes.

(9) Regulations for under-ground steam engine room, boiler ga[illegible]llery, and steam pipe track.

(10) A suitable rule of the form of General Rule 35 of the English Coal Mines Regulations Act, 1887, as to wilful damage, so far as it is not already covered by the Indian Penal Code.

(11) Suitable rule as to every person observing the directions of those in charge of the mine, with a view to safety, discipline, and compliance with the Act and special rules.

Each work-person to work only where directed, and, unless in case of emergency, not to go into any other part of the workings except such as he may necessarily pass through in going to and from his work.

(12) Rules for sinkers with a view to safety.

(13) Suitable provision for latrine accommodation for females.

I shall be prepared to give further explanations as to the foregoing, to give reasons for any departures from the English Acts, and for thinking that these proposals are suitable for India.

And shall also be ready, if called upon, to put the foregoing into definite form as a proposed Mines Act for India, and special rules.

An Act, as sketched out, appears to me to be the best way of giving effect to any precautions that should be taken for the protection of miners against accidents.

I received the following communcation in reply to the foregoing report:—

No. 590, dated Calcutta, 30th March 1894.

From—Dr. WILLIAM KING, B.A., F.G.S., Director, Geological Survey of India.
To—The Inspector of Mines in India.

Has the honour to forward a copy of the following for information, with reference to correspondence ending with his No. 39 of the 8th current.

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No. $\frac{892}{7}$, dated Calcutta, the 29th March 1894.

From—M. FINUCANE, Esq., M.A., C.S., Secretary to the Government of India, Revenue Dept.
To—The Director, Geological Survey of India.

SIR,

I am directed to acknowledge the receipt of the report by the Inspector of Mines, forwarded with your letter No. 536, dated 13th March 1894, and to say that the Government of India are not prepared, with the information at present before them, to undertake legislation on the lines suggested by the Inspector.

When Mr. Grundy has visited the principal mines and made himself acquainted with the facts and conditions of Indian mining, the Government of India expect to receive, and will be prepared to consider, any regulations which he may recommend for adoption with a view to legislation. In the meantime, Mr. Grundy should continue his enquiries, and when he has acquired sufficent information, it would be well for him to submit a draft of rules for the security of mines and protection of labourers on which the opinions of Indian mine-owners may be taken.

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## My "Inspection Report Forms."

An example of "Inspection report forms".

42. The following information is to serve several important purposes, for instance, it is an example of the way I got my inspection forms filled in wherever it was reasonably practicable to do so.

Object of including it.

It is also to show what can be done, and is being done as to Rules, a Benefit fund. Hospital, Schooling, Land cultivation, and meeting the people's requirements with a fine public bazar, in addition to the actual mining.

A manage-'s opportunities for doing good.

A Mine Manager in India appears to have vast opportunities for doing good to the mining population, and at the same time to be increasing the popularity and the success of his colliery. But he should be well able to speak to the people in their own language, be often amongst them, have great patience, and take almost infinite pains with them; have an intelligent appreciation of them individually, and as a whole, both socially and religiously. I have reasons for thinking that the people appreciate kindness, and are willing

to do something in return for it: but it is necessary to understand them, and I believe this may be taken as the key-note of success.

The Manager of the East Indian Railway Company's Collieries at Giridih has been striving for some years to fulfil the foregoing requirements, and the success of the colliery, and the well-to-do and contented state of the mining population there bear ample witness to the labour having been well spent; that the people appreciate the things that are for their good.

No children under 12 years employed East Indian Railway Company's Collieries.

It should be noted that no boy or girl under 12 years of age is employed at the East Indian Railway Company's Collieries, either below or above ground; and that no other than employees are allowed to go into the mine without special permission.

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**Inspection of Mines in India.**

1. Date—
   January 1894.
2. Owner or Company—
   East Indian Railway Company.
3. Name of Mine—
   Serampore.
4. Situation of Mine—
   Giridih, Hazaribagh Sub-Division, Chhota Nagpur, Bengal.

   Nearest Railway or other Station—
   Giridih. Pits one to two miles from station, connected by branch line.
5. Seams or vein, being worked—Name—
   Lower—Kurhurbari.

   Thickness—
   Varies from 8 feet to 30 feet.

   Nature of roof—
   Sound grey sandstone.

   Nature of floor—
   Strong micaceous shale.

   Nature of coal, or vein stuff—
   Strong steam coal; sometimes friable; has a well defined cleavage in constant direction.

   Amount of dip—
   Varies from 2° to 15°, is generally 6° to 15°.

   Direction of dip—
   Varies. The general direction is W.S.W.
6. Manager.—Name—
   Dr. Walter Saise.

   Address—
   Birwadi, Giridih, East Indian Railway.

   Qualifications and experience—
   English certificate of competency, 1878, Newcastle Four years' practical experience in England, and 15 years in India.

   Amount of supervision exercised—
   Daily in a general way. Make about 400 under-ground inspections per year.
7. Assistant Manager (if any)—Name—
   Thomas Adamson.

   Address—
   Biswastih, Kurhurbari Colliery, Giridih.

   Qualifications and experience—
   Was a Colliery enginewright in England. Had 7 years' experience in Indian mines.

Amount of supervision exercised—

Daily. Makes under-ground inspections every day His orders have the same force with work persons as the manager's.

8. Other Officials or Superintendents (if any)—Number—

Two European overmen, and one European contractor.

Duties—

*Overman.*—Meet all Sirdars at 7 A.M., for reports, and on those reports to arrange order of their own inspections, and give instructions to Sirdars; also inspect, and draw timber.

9. Inspection and Reports—

Any inspection of mine by recognized officials—

Yes, by both European and Native overmen, and Company's Sirdars. Manager, and Assistant Manager also record a report of every inspection. Reports seen, J. G.

Nature of inspection—

All the places and roads in which persons work or pass are daily examined by some one of the above, both by looking at and sounding.

Before commencement of each shift—

Yes, by Sirdars and roof examiners. Also by Europeans if any part is considered by Sirdars to be bad.

During shift—

Yes, by overmen, and contractors.

When made—

Any time during shift.

By whom—

Overmen, and contractors. No European to be absent from his work without a medical certificate.

What recorded reports as to ventilation, roof and sides, and general safety; machinery, ropes, boilers; and shafts along which persons travel; and by whom made.

Daily of ventilation, roof and sides, and general safety of each mine by Sirdars and by the Sahibs for the mines, they inspect. Machinery and ropes examined more or less every day, but not all of it, by enginewright, with daily report. Boilers examined and reported on by enginewright when cleaning at from 2 to 12 weeks; the longer time during rains. Shaft's sides examined by enginewright as with machinery; and specially examined by two sinking Sirdars about once in two months, and report.

At least one shaft must be examined daily along with machinery.

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**Serampore Colliery. Suplementary information.**

*Contractors.*—Contractors contract for working and raising the coal up to landing in wagons on surface main line. Provide their own labour, and all accommodation for labourers—housing, medical attendance,—all expenses for enginemen, surface haulage, timbering, and all other expenses connected with the working of the coal. They pay their men directly.

The duties of a contractor are precisely similar to an overman in his own mine.

About 800 persons are under contractors, and 500 persons are directly under Company as workers under-ground.

Sirdars.—There are 15 Sirdars at Serampore employed by Company, and 18 employed by contractors. Also 18 roof examiners, 12 propping mistaris, and 26 assisting cooleys.

Work of Sirdars.—The 15 Sirdars inspect the mine daily at from 5 A.M. to 7 A.M., accompanied by roof examiners and cooleys. They get a Hindi report written for them, in English characters, referring to any bad places, goaves, and ventilation; this is signed by them, after having heard it read. This report is dealt with by overman, and then sent on to Manager.

Duties of roof examiners.—Roof examiners examine and repair roof where required, with Sirdars at 5 A.M., and during day.

Propping mistaris.—Propping mistaris, timber roof where required, and where instructed by Sirdars and overmen.

10. Examination of own working place by workman—

The best miners examine by looking and knocking by flat side of pick.

11. System of working—Particulars—

I. South Staffordshire system of working out from 5 to 10 feet of coal over an area of 40 feet wide and 80 feet long.

Along pillar.—Drive place 10 feet wide, and then work out pillar to within 3 hobs of not less than 6 feet square; top coal timbered. Five shot holes are put in each nob with 10 oz. dynamite in each hole, timber drawn out, shots lighted, and nobs and top coal blown down. All worked back towards pit. II.—Pillar and Stall. Pillars 20 feet × 60 feet, 20 feet square, 40 feet square, 60 feet square, and 60 feet × 100 feet. Roads 10 feet wide driven from 6 feet to height of seam, sometimes in top, others in bottom coal. Pillars worked out coming back. Mine divided into districts. Floor coal first taken up, and then pillars worked out in sections from roof downwards. All slack is raised.

12. Ventilation.—Cubit feet of air per minutes—

30,000 cubic feet at No. 11A. 132,000 cubic feet per minute for the 1,300 miners.

Number of splits or sections—

Six upcast shafts, and at least that number of downcasts.

How often measured and recorded—

Occasionally.

Description of ventilating apparatus if any—

Three furnaces, and a hanging grate. All fed with return air, and always burning day and night.

Other particulars.—Air-doors, air-crossings, stoppings, bratticing, etc.

Air doors of wood. Also sheeting. They are single except at 16A. Round iron pipes 12 inches and 24 inches diameter used occasionally. Wood, brick, and stone stoppings, with mud mortar, and cow dung plaster.

Is firedamp found—

No.

Frequently or rarely—

Not at all.

Whether regularly tested for, and how—

Not tested for.

Any other noxious gas found—

Often find carbonic anhydride or black-damp; is probably given off from the coal.

13. Plans—

Are accurate plans of under-ground workings kept—Yes.

On what scale is plan made—

100 feet per inch for general plan of colliery. 40 feet per inch for working plans of mine.

How often made up—

The work is constantly going on by Surveyors

By whom.—

Native Surveyors trained at the colliery.

Is direction and rate of dip shown—

Yes.

Is a section of the strata kept—

Yes. Sections of all sinkings, and borings, are kept in book form.

14. Shafts, or outlets, etc. Kind—
Vertical, circular and oval, shafts. Also inclines.

Number—
Ten working shafts.

Size—
Circular pits are 10 to 12 feet diameter.

Depth—
80 feet to 349 feet.

How secured—
Bricked at surface and down to stone head, and in bad places.

Relative positions—
None closer together than 200 feet.

How persons enter and leave the mine—
By cages in shafts. By walking in along inclines.

How mineral is brought out of mine—
By hauling inclines in gangs of tubs, and upshafts in tubs and cages, and in buckets.

Age and experience of enginemen and boilermen—
Enginmen 21 to 50 years. Boilermen 16 to 50 years. No engineman winds men under 25 years of age.

As to fencing tops of used shafts and side entrances—
Gates and fencing on all shaft tops.

As to fencing tops of unused shafts and side entrances—
The oldest shafts are fenced round with aloes or Mohrubar plant. Newer shafts with brickwork, or with fencing wire.

Signalling—
Electric signalling, and rapper with wire.

Code of signals—
Have a code of signals. "Rules for signalling in incline at Kurhurbari and Serampore." And also "Rules for signalling in shafts.' Both these sets of rules are printed in English and in Bengali characters, and posted at top and bottom of pits and inclines.

## EAST INDIAN RAILWAY.

### Rules for signalling in incline at Kurhurbaree and Serampore.

RAPPER SIGNALS.

1 Rap. Hold after the set has been rapped away.
2 Raps. Lower off.
3 „ Haul away the set.
6 „ When men are going up or down the incline.

*Note*—

(1)—When men are required to be sent up the incline, 6 Raps to be given from the onsetter and 1 Rap to be returned from the banksman, when they can go up. When they arrived at the top, 4 Raps to be given from the banksman.

(2)—When men are going down, 6 Raps to be given from the banksman and 1 Rap returned from the onsetter; when they have reached the bottom, 4 Raps to be given by the onsetter.

(3)—No person to leave the top or bottom when the set is running.

**Rules for Signalling in Shafts.**

RAPPER SIGNALS.

| | |
|---|---|
| 1 Rap. | Raise the cage from rest. |
| 1 „ | Stop cage while running. |
| 2 Raps. | Lower cage. |
| 3 „ | Men to ride. |
| 5 „ | Turn the steam on. |
| 6 „ | Shut the steam off. |

*Note*—

(1)—When men are going to ascend, 3 Raps to be given from below. When 3 Raps have been returned from bank, the men to get into the cage. 1 Rap to be given when the engineman will draw away.

(2)—When men are going to descend, 3 Raps to be given from bank (top), and no one to get into the cage until the onsetter has given 3 Raps from bottom.

(3)—During the working hours no one to work the signals except the banksman and onsetter.

Particulars of any ladders used—

None in use.

Are chains used for lowering and raising persons—

No, except the four short chains to cages.

Places of refuge on incline planes—

10 ft. to 20 ft. apart, but signals are to stop sets from being run while people are travelling in inclines.

15. Machinery—Fencing—

All fenced.

Winding ropes, number—

Full particulars of ropes given on a separate paper.

Kind and make—

Round, steel with hemp core. Made by Haggie Bros. and by Messrs. Elliott & Co., carefully selected and tested.

Size and strength.
Working length.
How long been in use, and average life.

} See particulars on separate paper.

Any record of rope breaking—

Yes. On the 1st April 1874, a steel rope broke at the end of capping; one man was killed and four injured. The shaft was worked by a gin.

Actual working load—

See separate paper of particulars.

Whether persons ride—

Yes.

Number at one time—

Four in single cages, and 8 in double cages.

Number per day—

50 to 150.

Other particulars—Speed of winding in shafts and planes, brakes, safety catches, cover overhead, drags, stop-blocks, or other precautions to prevent accidents—

Quickest winding is 8 feet per second in shafts.
Hauling 10 ft. per second on inclines.
Brakes on all drums. No safety links. Have keps; covers to all cages; drags, and stop-blocks on all inclines. Also rope and sliding weight indicators, with bell to show position of cage in shaft.

Particulars of use of other ropes and chains.—

Have 1½" to 2¼" steel wire ropes on self-acting inclines.

Ropes 2¼" to 3¼" steel wire for lifting pump sets. No chains in use except on cage tops to D links.

Boiler fittings—

All the ordinary fittings, steam and water gauges and cocks, safety valves, manholes, injectors or pumps, etc.

Cleaning boilers—

Lancashire and Cornish boilers cleaned monthly. Tubular and locomotive boilers cleaned weekly.

Inspection—

Some one or more are inspected daily externally. Inspected internally on cleaning. Thoroughly by Government Inspector yearly.

Steam pressure—

40lbs. to 80 lbs. Locomotive 140 lbs.

16. System of lighting—Particulars—

Castor oil in earthenware chiraghs is generally used Open lights. Kerosene oil in specially made lamps. Electric light, have 30 incandescent lamps, but not at present in use.

17. Blasting—In coal—

Blasting stumps to get down top coal; done only by Europeans.

In roof—

Occasionally.

When persons in or out—

Both.

Explosives used—

Country gunpowder and Bickford's tape fuze. Dynamite and detonators, and electric fuzes.

By whom charged, and lighted—

Sirdars (Sinkers and drifters).

What inspection made—

These Sirdars inspect when holes are ready.

Particulars of tamping and ignition—

Powder tamped with well dried clay and by copper-headed rammers. Dynamite has water tamping only, fired electrically in sinking, but with Bickford's fuze and detonators and water tamping in mines.

Shots missed fire—

When this happens, it has to be left for 8 hours, not to be unrammed, nearest hole to be 3 feet away.

How explosives taken into mine—

By hand in a box or leather bag. One person takes the dynamite, and another person takes the fuzes with the detonators attached.

How stored—

In powder magazine.

Mines wet or dry—

Both, but dependent on season.

Dusty—

Sometimes a little dusty in return airways.

18. Accidents, etc.—Security of roof and sides, etc., of roads and working places, and by whom secured—

Accidents rare at this colliery. Security of sides and roads and roof in working places is done by propping mistaris under control of European overmen, contractor, and sirdars. Miners are being induced, but not with much success to timber their own working places. At this colliery it is the rule to "pluck" or pull down the loose stones of the roof, and not to timber it if it can be avoided.

Provision of props and other timber, etc.—

Sal and fir railway sleepers, 10 feet long by 10″ × 5″, make excellent chocks and props. Use from 12,000 to 18,000 of these yearly. Rollers or props or trees, 9″ diameter, are used for timbering full height of seam. Any one engaged in propping or in directing the work can take whatever timber he wants.

Provision of stores—

Explosives, candles, lamps, tools, etc.—All provided by company except chiraghs. Oil and other things are found free up to quantity allowed per ton of coal; all over that amount is chargeable.

Particulars of accidents in, and about, the mine—

Particulars given on separate sheet.

What notices are given of accidents—

Ditto.

What investigations are made of serious accidents—

Ditto.

Any ambulance apparatus kept—Particulars—

Have a fine hospital and appliances, and a medical staff.

## HOSPITAL.

*E. I. R. Colliery Hospital and Medical supervision.*

The Medical staff consists of—

(*a*) An Assistant Surgeon.
(*b*) Three Native Doctors.
(*c*) A compounder.

The Assistant Surgeon lives near the hospital, as also does the Compounder. The three Native doctors live in three different parts of the colliery estate, and each doctor has a certain number of villages under his supervision. Each Native doctor has to visit these villages several times a week and to attend to any summons for medical aid at any moment.

The hospital has a dispensary. A consultation room and office, and three wards, two for men and one for women. Three sides of the hospital are provided with verandahs useful for convalescents, and a large chabutra. There is a large cooking shed for preparing food of patients. A mehter and a peon are attached to the hospital.

In all cases of accident the patient receives his usual pay, and, if a coal-cutter, 4 annas per day and his food which is prescribed by the Assistant Surgeon. The food is supplied dry.

A relative of a patient, either mother, daughter, sister, brother, etc., is paid to attend on the patient and to cook his food, and such person receives the pay usual in the district, *e.g.*, a man, Ro-2-6 per day, a woman Ro-1-6.

Clean clothes are provided for patient on admission, and, whenever necessary, afterwards, until discharged. Bedding, blankets, etc., are supplied by the Company.

The above expenses for contractors' men are recovered from contractors, who have no right and are not allowed to criticise the items if passed by the Colliery Manager.

The cost of medical supervision and medicines is, per annum, R4,768.

Of this amount R137-7-6 is recovered from contractors as the share due for attendance on their labourers and themselves, the amount being arrived at then R25-10-0 for contractors, and R111-13-6 for labor.

| | | | |
|---|---|---|---|
| Europeans or Eurasians at R6 per head per annum. | | | |
| Babus | at R2 | „ | „ |
| Coal-cutters | at 0-0-9 | „ | „ |

*vide* Agent's Resolution No. 1197, copy attached.

A few years ago it was impossible to get wounded men to come to hospital. Now the reverse is the case; and in bad medical cases—fevers or dysentery—persons come for admission.

TABLE XXXI.—*Statement showing the working of dispensaries during 1892-93.*

| District. | Name of Dispensary. | Income from | | | | | Expenditure. | | | | Total No. treated. | | | Daily average No. of in-patient. | Daily average No. of out-patient. | Cost of diet per in-patient. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Municipal grant. | District Board grant. | Government. | Private subscription endowment, etc. | Total. | | | | | In patient. | Out patient. | Total. | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Hazaribagh (Giridih). | E. I. R. Collieries Hospital and Dispensary. | Supported by E. I. R. Co. for employés and relatives. | | | | | *Establishment.* One Assistant Surgeon, Three Native Doctors, One Compounder, etc. | R 3,664 | a. 0 | p. 0 | 157 | 14,454 | 14,611 | 5 | 72 | Annas 3 per day per person. | |
| | | | | | | | English Medicine | 237 | 0 | 0 | | | | | | | |
| | | | | | | | Bazar Medicine | 298 | 0 | 0 | | | | | | | |
| | | | | | | | Incidental charges including Blankets, Dhotis, Bed-sheets, Beds and oil, etc. | 260 | 0 | 0 | | | | | | | |
| | | | | | | | Diet for Sirkari patients | 309 | 0 | 0 | | | | | | | |
| | | | | | | | Total | 4,768 | 0 | 0 | | | | | | | |

E. I. R. HOSPITAL:
GIRIDIH,
*1st April 1893.*

WALTER SAISE,
*Manager, E. I. R. Collieries.*

HEM CHANDRO MOOKERJEE,
*Assistant Surgeon, E. I. R. Hospital, Giridih.*

Direction of persons as to their work—

It may be summed up, for Natives, in manager's instructions to all new overmen—"Do not be satisfied with telling men how to do the work, but *show* them how to do it."

All systems, down to details, are laid out by Manager and Assistant Manager.

Experience required of getters or hewers of coal or other minerals—

None. At this colliery the thick seam attracts many new men. The miners at this colliery are (except 50 per cent. who reside here) not as good as Kurhurbari Colliery miners.

Position of workings relative to other workings—

Raniganj Coal Association on east boundary, known from plans.

Position of workings relative to *old* works—

Own old workings known. Also some of the Raniganj Coal Association.

Any known accumulation of water or of noxious gas—

Water in 42-B and 16-G, extent known, and it is separated from workings by faults.

$CO_2$ in the fire area at 11-A, this is dammed off from No. 25 workings and daily inspected.

Position of workings relative to surface property—

Mineral branch line and wharf of East Indian Railway on the estate. No public roads. All goaves pegged out on surface, and villagers warned of workings under-ground.

Healthiness of employés—

Good. The Railway Company spends a large sum on medical attendance and avoidance of cholera and small-pox. No unvaccinated person employed.

Provisions for housing, food, drink, and clothing—

Sufficient number of houses supplied at Company's expense, but the huts are built by people to suit themselves. Food easily got at East Indian Railway weekly bazar. Most of the people grow a few months' supply of rice and Indian corn on land let at low rents by the Company. All labourers get two hot meals daily; formerly they could not get one. Water supplied by Company from wells or hydrants. All are well clothed, and ample supply of clothing at small and general bazar. About 8,500 people residing in Company's property.

*Land let to employés at the East Indian Railway Company's Collieries.*

1. Coal-cutters get two biggahs per coal-cutter; then a family of a father and three sons cutting coal would get 8 biggahs, about 2½ acres, and grow enough rice for several months' food.
2. Sirdars, coal-cutting and sinking, get 4 biggahs.
3. Other labour gets what is left at Manager's discretion.
4. Occupancy for 9 years certain, if working well.
5. Rent—

| | per biggah. R a. p. |
|---|---|
| 1st class rice land | 0 13 6 |
| 2nd do do. | 0 12 0 |
| 3rd do. do. | 0 9 0 |
| 4th do. do. | 0 7 6 |
| Bariland or garden land | 0 8 0 |
| Sugar-cane | 1 2 0 |

The profit on cultivations, after paying all expenditures, is equivalent to a bonus of R15,000, divided amongst the labour yearly.

19. Rules and discipline—Any rules in force for the regulation of the mine, for the prevention of accidents, and for securing proper discipline.

Particulars.

*Rules for Underground Mining Staff.*

1. This supersedes all custom, all previous Orders and Circulars.

2. At each colliery the European and Native overmen, the underviewer or Mine Inspector, and apprentices, and the coal-cutting contractors shall meet at the colliery office at 7 A.M.

3. All mining sirdars shall, after inspecting the mines or parts of mines in their charge, also meet at this office, and shall write or cause to be written a succinct statement of the morning inspection.

4. These reports shall be read out to the sirdars, who shall confirm them; the Chairman (senior Mine Inspector or overman) shall then give orders on such reports, and shall write a short account of such orders on these reports and send them to the Manager's office.

5. Any case of untrue report to be notified to the Assistant Manager or Manager, with all the facts relating thereto, without delay.

6. Each colliery may be sub-divided into parts for covenience of work, and such part shall be considered a colliery in Rule 2.

7. All overmen, contractors, and sirdars shall stop any work they may consider dangerous, whether the work be in their immediate charge or not, and shall give early notice to the overman or contractor in charge of having done so.

8. The Assistant Manager, Mine Inspector, all overmen, apprentices and contractors shall write each morning a statement of previous day's work specially referring to—

1. Ventilation.
2. Safety of places.
3. Any information of faults, gallery driving, and so on.

9. In drawing timber, two Europeans must be present, and one must be a Company's servant. An infringement of this order will be considered a grave offence.

Rule 9. Or one of the Native staff mentioned in the schedule attached.

Schedule referred to in Rule 9:—

Gheya Meah.
Pema Dosadh,
Degan Koeri.

*Vide* Consulting Engineer's letter No. 5558 of 13th November 1893. *Vide* Consulting Engineer's letter No. 447 of 26th January 1894.

10. Dropping roof coal and pillars to be done at night, if possible, when the mine is clear of labour.

11. No European or Native overman or contractor to be absent from a colliery, except for a few hours in the evening, unless by—

1. permission for a night from senior overman or Mine Inspector or Assistant Manager.
2. permission to leave the station from Manager or Chief Engineer.

12. On Thursday the Benefit Fund Meeting to be held before sirdars' daily reports are read.

13. Each Mine Inspector, overman, apprentice and contractor to acknowledge receipt of these rules in writing.

WALTER SAISE,
*Colliery Manager.*

F. E. ROBERTSON,
*Chief Engineer.*

30TH JUNE 1893.

20. Whether there would be any difficulty or objections to supplying notices as is provided for in section 36 of English C.M.R.A., 1887—

No.

21. Any difficulty or objections to supplying a yearly return as provided for in English C.M.R.A., 1887, section 33, and schedule 3—

No.

22. Use of animals—

Twelve ponies hauling on levels under-ground. They are brought to the surface weekly.

23. What schooling provision for children—

## SCHOOLS.

### *E. I. R. Miners' Schools.*

Schools were started on 7th December 1888, by the Colliery Manager, with the assistance of the Free Church of Scotland Missonaries at Pachamba. In March 1889 the Company voted a grant of R25 per month, and increased it to R50 in 1893, and again to 1 for every ten children in December 1893, the amount of grant under this last sanction is R110 per month for 1894.

Since commencement of schools 114 children have been presented for Lower Primary examination, and 95 have passed.

In December 1893 96 children were presented for examination in Lower Primary, the results are not yet known.

Of the 1,403 children attending, fully half can read easy words and 500 can write their names and read other children's signatures. The object of schools is to provide a place for children not at work; to make them intelligent, and to make them a match for the village shop-keeper. The best of children will be trained as sirdars and skilled artisans. Government gives grants in usual way through the Deputy Commissioner, Hazaribagh.

The attendance and number of schools and teachers is as under:—

| | |
|---|---|
| Schools, boys and girls | 22 mixed. |
| Ditto, girls | 2 |
| Ditto, night | 4 for miners and other labourers. |
| Daily average attendance | 1,142 |
| Number on roll | 1,408 |
| Number of teachers | 27 |
| Number on rolls, boys | 1,092 |
| Ditto, girls | 316 |
| Average attendance, girls | 218 |
| Ditto, boys | 924 |

24. How is amount of wages determined—

Sirkari labour have daily wages, paid weekly. Surface men, Ro-2-6, women, Ro-1-6. Under-ground men, Ro-2-9, women Ro-2-0. Contractor's labour paid weekly on same basis as sirkari labour. All contractors' labour have right to appeal to Manager direct, and his decision as to pay is final. Skilled labour is paid according to demand, Ro-3-0 to R1-5-0 daily. Miners are paid by measure in buckets or tubs from Ro-1-6 to Ro-5-0 per bucket, as determined by overmen and agreed to by miners. Only one proviso—all hard-working miners must get a minimum wage of Ro-4-0 per day.

25. Where, and when, and how are wages paid—

Sirkari labour at three centres by the box system. Contractors also pay at three centres. All payments in coin of the realm.

26. Is any Register kept as to boys, girls, and women, of—Name—

No.

Age—

Residence—

Date of first employment—

Have printed lists of villages with number of house, name of occupier, name of family, relation of persons to occupier, age, caste, occupation, and where employed. There is also a register kept of all members of the "Colliery Benefit Fund," and this register is also practically a record of the date of first employment.

### E. I. R., Colliery Benefit Fund Rules.

1. The Fund shall be called the East Indian Railway Colliery Benefit Fund.

2. All native employés engaged in manual labour or the supervision thereof, either directly for the East Indian Railway (hereinafter called the Company), or for their Con-

tractors and all residents on the East Indian Railway estate at the time the Fund is started, are eligible for and must join the Fund. Provided always that no member of the East Indian Railway Provident Fund is eligible.

3. All outsiders, that is, persons not resident on the estate but employed in the Collieries or in connection therewith who begin to work after the Fund is started and also members absenting themselves without leave are to work for one month after commencing or recommencing work before being allowed to join or rejoin the Fund. Provided that outsiders temporarily discharged in consequence of short work may continue their subscriptions at the discretion of the Sub-Committee or may rejoin after working one week.

4. A Register will be kept of all members of the Fund.

5. All men to pay at the rate of one pice per week to the Fund and all women and children at the rate of one pice per fortnight or half a pice per week.

6. The contributions as laid down in Rule 5 will, in the case of Company's employés, be deducted from their wages weekly. In the case of Contractors' employés, the Contractors shall remit each Monday to the Treasurer the amount of contributions with a statement of number of men, women and children represented and when required the names and addresses of all these persons. They shall also remit fines and unpaid wages accompanied by a list giving the names of the persons unpaid or fined.

7. All fines levied under the rules of the Company from Colliery employés who are or have been members of the Fund shall from the date of its establishment be credited to the Fund.

8. All available unpaid wages on the date of formation of Fund and those accruing hereafter shall when lapsed be credited to the Fund.

9. The benefits to be allowed by the Fund to subscribers are as follows :—

| | | | |
|---|---|---|---|
| | | *R* | *a.* | *p.* |
| For sickness— | | | | |
| Men | per week | 0 | 12 | 0 |
| Women | „ | 0 | 6 | 0 |
| Children | „ | 0 | 4 | 0 |
| For living births | | 1 | 8 | 0 |
| For deaths— | | | | |
| Adults | | 4 | 0 | 0 |
| Children not under 3 years old | | 2 | 0 | 0 |

Sick Benefits to be paid only for such members of a family as are subscribers. These amounts are liable to revision from time to time.

10. Sick benefit shall not be given for less than 3 days' certified absence, and for these and broken periods over a week the payments shall be—

| | | | | |
|---|---|---|---|---|
| | | *R* | *a.* | *p.* |
| Men | per day | 0 | 2 | 0 |
| Women | „ | 0 | 1 | 0 |
| Children | „ | 0 | 0 | 9 |

11. No payments shall be made to in-patients of the Company's hospital at Giridih while in receipt of pay.

12. All benefits to be paid weekly.

13. The Fund shall be managed by a Committee consisting of—

| | |
|---|---|
| The Chief Engineer. | One European Contractor. |
| The Colliery Manager. | One Native Contractor. |
| Assistant Colliery Manager. | Four Sirdars. |
| Colliery Accountant. | |

The Chief Engineer or in his absence the Colliery Manager or his Assistant acting for him shall be Chairman.

14. Three Members of the Committee, one of whom must be a member qualified under Rule 13 to act as Chairman, shall form a quorum.

15. The Committee of Management shall transact the ordinary business of the Fund, but shall have no power to alter or suspend any of these Rules without the sanction of the Agent. They shall meet monthly or oftener, if necessary, and their proceedings shall be regularly recorded by the Secretary in a Minute Book to be kept for the purpose.

16. The Committee of Management shall submit to the Agent, as soon as possible, after the close of the half-year, for the information of the Board of Directors, a statement

of the receipts and disbursements of the Fund and a half-yearly report, and shall also furnish such other accounts or information as may be from time to time required by the Board of Directors or the Agent.

17. A Sub-Committee to be nominated for each Colliery by the Committee of Management and consisting of one European employé, two Contractors and all Sirdars, shall prepare weekly a paysheet for sick or birth or death payments and shall submit these paysheets after counter-signature by the Colliery Assistant Surgeon, to the Colliery Manager who after approval will transmit them to the Treasurer of the Fund for payment.

18. A European or native employé officiating for European and any two others shall form a quorum of the Sub-Committee.

19. The Colliery Accountant shall be the Secretary and Treasurer of the Fund and shall keep a record of the contributions and payments in the form attached and shall send a copy monthly to the Chief Auditor. The copy of the account sent to the Chief Auditor should be accompanied by the Fund paysheet for disbursements.

20. The Treasurer shall, under the orders of the Committee of Management, send the weekly payments made up in boxes to each Colliery by the pay clerk to be paid to those who shall be entitled to receive them.

21. Unpaid wages not claimed for 12 months after being earned will be paid to the credit of the Fund. The Colliery Manager will submit monthly for Audit, a statement of all wages that have been unclaimed for more than 12 months, and the amount of this statement will after audit be paid to the Fund.

22. The Chief Auditor will, each month after the receipt of the account mentioned in Rule 19, bring to the notice of the Agent the cash balance in hand, and it will then be determined, in communication with the Managing Committee, whether any portion of it should be deposited in the East Indian Railway Savings' Bank in the joint name of the Chief Engineer and the Colliery Accountant as trustees for the Fund, or in what other manner it is to be disposed of.

23. The aggregate of the contributions levied in respect of the employés entered in each Colliery paysheet, should be noted on the paysheet by the Colliery Manager, and afterwards made over to the Treasurer. Fines levied in accordance with Rule 7 should be similarly dealt with unless recovered at pay time when they will be remitted by supervising officer to the Treasurer.

24. All Benefit Fund money in hand is to be kept in the Colliery cash safe in a separate cash box, distinct from other Colliery moneys.

25. The Company to assist the Fund, guarantee to the subscribers during the first five years the benefit allowances herein laid down subject to a maximum expenditure in such allowances of a sum equivalent to the contributions levied by the Fund from subscribers, such assistance being moreover limitted to ₹200 in any month, and ₹2,000 in a year. The Company accepts no responsibility in respect to the distribution of benefits for which the Committee of Management must be accountable. Amounts paid by the Company under this guarantee to be considered as advances to the Fund to be repaid as soon as in the opinion of the Agent of the Company the Fund is in a position to make the repayment. The benefits to be allowed by the Fund not to be increased beyond the amounts now fixed as long as any such advances remain unpaid.

26. Advances to the Fund under the previous rule will be made from the Fine Fund of the Company under the authority of the Agent on applications from the Committee of Management.

CALCUTTA;
*June 24th, 1892.*

R. GARDINER,

# EAST INDIAN RAILWAY.

*Abstract of account of Colliery Benefit Fund from commencement up to 31st December 1893.*

| Receipt. | Amount. | | | Expenditure. | Rate. | Amount. | | | Total. | | | Remarks. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ₹ | a. | p. | | | ₹ | a. | p. | ₹ | a. | p. | | | | |
| To amount of contributions received | 6,447 | 11 | 4½ | 633 births | @ 1-8 | 949 | 8 | 0 | | | | | | | |
| Ditto Fines | 1,358 | 8 | 7½ | 285 ditto | „ 2-8 | 712 | 8 | 0 | 1,662 | 0 | 0 | | | | |
| Ditto of unpaid wages up to June 1892 | 2,681 | 14 | 3 | 263 deaths | „ 4-0 | 1,052 | 0 | 0 | | | | | | | |
| | | | | 81 ditto | „ 2-0 | 162 | 0 | 0 | 1,214 | 0 | 0 | | | | |
| | | | | SICKNESS. | | | | | | | | | | | |
| | | | | 5,000 men | | 3,144 | 10 | 0 | | | | | | | |
| | | | | 2,067 women | | 681 | 13 | 0 | | | | | | | |
| | | | | 257 children | | 64 | 13 | 0 | 3,891 | 4 | 0 | | | | |
| | | | | | | | | | 6,767 | 4 | 0 | | | | |
| | | | | | | Balance | ... | ... | 3,720 | 14 | 3 | Amount deposited in East Indian Railway Savings Bank | ₹ 3,791 | a. 2 | p. 4 |
| | | | | | | | | | | | | Less paid by Secretary | 70 | 4 | 1 |
| Total Rupees | 10,488 | 2 | 3 | | | Total Rupees | | | 10,488 | 2 | 3 | Total Rupees | 3,720 | 14 | 3 |

CALCUTTA;
*The 8th January 1894.*

J. N. MOOKERJEE,
*Secretary and Treasurer.*

## Serampore Colliery, E. I. Ry. Co.

*Number of persons*

| Description. | Number. | Hours when employed. | Number of hours per day. | Number of hours per week. | Number of days per week. |
|---|---|---|---|---|---|
| UNDER GROUND. | | | | | |
| Men | 1,002 | 9 A.M. to 5 P.M | 8 hours; bank to bank. | 48 hours, but fully 50 per cent do not work Mondays. | Six days; but 50 per cent only work five days. |
| Boys of 10 to 16 years | 120 | ,, | | | |
| ,, under 10 years | ... | ,, | | | |
| Women above 16 years | 380 | ,, | | | |
| ,, 12 to 16 years | 85 | ,, | | | |
| Girls under 12 years | ... | ,, | | | |
| TOTAL BELOW GROUND | 1,587 | | | | |
| ABOVE GROUND. | | | | | |
| Men | 510 | 6 A.M. to 5 P.M | 9 hours. | 54 | Six. |
| Boys of 10 to 16 years | 76 | ,, | ,, | ,, | ,, |
| ,, under 10 years | ... | ,, | ,, | ,, | ,, |
| Women above 16 years | 282 | ,, | ,, | ,, | ,, |
| ,, 12 to 16 years | 89 | ,, | ,, | ,, | ,, |
| Girls under 12 years | ... | ,, | ,, | ,, | ,, |
| TOTAL ABOVE GROUND | 957 | | | | |
| TOTAL ABOVE AND BELOW GROUND | 2,544 | | | | |
| | | | | | |
| UNDER GROUND. | Ages. | | | | |
| Youngest boys | 12 | ... | ... | ... | ... |
| ,, girls | 12 | ... | ... | ... | ... |
| Oldest women | 50 | ... | ... | ... | ... |
| Number of married females | 453 | ... | ... | ... | ... |
| ,, unmarried females | 12 | ... | ... | ... | ... |
| ABOVE GROUND. | | | | | |
| Youngest boys | 12 | ... | ... | ... | ... |
| ,, girls | 12 | ... | ... | ... | ... |
| Oldest women | 58 | ... | ... | ... | ... |
| Number of married females | 352 | ... | ... | ... | ... |
| ,, unmarried females | 19 | ... | ... | ... | ... |

Persons other than employés, as above, allowed in the mine. —None allowed.

A similar report was made up for the Company's Kurhurbari Colliery.

*Dated — January and February 1894.*

*and hours of employment.*

| Intervals for meals. | Between shifts. Intervals between periods of employment. | Kind of work. | Wages. | Remarks. |
|---|---|---|---|---|
| | | | *R a. p.* | |
| None | 16 hours | Coal-cutters, sirdars, stone-men, propping and rail men. | 0 3 0 to 0 8 0 per day. | |
| ,, | ,, | Coal-cutters and trammers. | 0 2 0 to 0 4 0 ,, | |
| ,, | ,, | ..... | ..... | |
| ,, | ,, | Coal carriers and putters. | 0 2 0 to 0 4 0 per day. | |
| ,, | ,, | Ditto | Ditto. | |
| ,, | ,, | ..... | ..... | |
| 2 hours | 13 | Mechanics, enginemen, screeners, firemen, masons and labourers. | 0 2 6 to 1 5 0 per day. | |
| at 12 noon | ,, | Apprentices and labourers. | 0 1 6 to 0 2 6 ,, | |
| to 2 P.M. | ,, | ..... | ..... | |
| ,, | ,, | Screeners, loaders, and mason's labourers. | 0 1 6 to 0 2 1 per day. | |
| ,, | ,, | Ditto | 0 1 0 to 0 1 6 ,, | |
| ,, | ,, | ..... | ..... | |

No children work under 12 years as near as age can be judged.

## KURHURBARI.

*Labour week ending 13th January 1894.*

| | Men. | Women. | Children. | TOTAL. |
|---|---|---|---|---|
| Coal-cutters and carriers | 725 | 342 | 2 | 1,069 |
| Other under-ground labour | 212 | 13 | 5 | 230 |
| Total | 937 | 355 | 7 | 1,299 |
| Surface | 659 | 258 | 27 | 944 |
| Total | 1,596 | 613 | 34 | 2,243 |
| Coking | 100 | ... | ... | 100 |
| Total | 1,696 | 613 | 34 | 2,343 |
| Sick and wounded | 43 | 10 | 3 | 56 |
| Total | 1,739 | 623 | 37 | 2,399 |
| **SERAMPORE.** | | | | |
| Coal-cutters and carriers | 692 | 558 | ... | 1,250 |
| Other under-ground labour | 190 | 23 | 5 | 218 |
| Total | 882 | 581 | 5 | 1,468 |
| Surface | 384 | 343 | 47 | 774 |
| Total | 1,266 | 924 | 52 | 2,242 |
| Coking | 75 | 19 | 5 | 99 |
| Total | 1,341 | 943 | 57 | 2,341 |
| Sick and wounded | 32 | 6 | ... | 38 |
| Total | 1,373 | 949 | 57 | 2,379 |
| Total of both collieries | 3,112 | 1,572 | 94 | 4,778 |

COLLIERY MANAGER'S OFFICE
E. I. R., GIRIDIH,
*The 22nd January 1894.*

WALTER SAISE,
*Colliery Manager.*

With reference to the foregoing, I have received the following communication from Dr. Saise, the Manager :—

DEAR SIR,

The following are changes and improvements made since your visit of inspection in February :—

Reports. 1. Europeans' reports of inspections are written on eve of day of inspection, and not on following morning.

Inspections. 2. The European staff has been so increased as to ensure an inspection daily of every place in broken workings, and nearly every day in gallery driving.

Reports. 3. Inspection book is kept at each mine, and all sirdars and Europeans have to state in this book the time they leave the mine and the state of mine at time of inspection. The entries are made in English, in Hindi, and some in Bengali.

First aid to the injured. 4. All sirdars can now staunch bleeding of femoral and brachial arteries with improvised tourniquets. No wounded man is moved from the mine, except under care of medical man after he has been made comfortable. The Company has provided three accident or first aid boxes with complete fittings to be carried to scene of accident at once.

The mean result in several cases is that in 30 minutes the doctor and box are at hand, the sufferer having been previously attended to by pit sirdar.

I consider your visit and criticisms have done much good.

No increase of working cost. The cost of these improvements has not increased the cost of coal per ton. The coal is cheaper than for corresponding half of 1893.

## The Mining people of Bengal.

Objects of study. 43. During the whole time that I have been in India, the people, their habits and customs, peculiar characteristics, and religions have received constant attention; and while in the colliery districts, I directed my attention more especially to those employed in and about the mines. This was quite necessary for many reasons, for instance, to know the people with whom one has to deal; to know why the people do, and refuse to do, certain things, and the strength of the views and beliefs determining this; to find out whether the people are quick or slow to change, and the effect that any changes would make on them; and to get to know the differences between the Indian native and the English, whose mining laws it has been thought should be introduced, with slight modifications, as laws and regulations for the working of Indian mines.

Object of the following information. I, therefore, propose to give a few particulars which I trust will be sufficient for the purpose in view, namely, to show the distinctive characteristics of the Indian people, but more especially the Indian miners, as distinguished from the English, and from others who will be supposed to be sufficiently known for comparison, and to show who the people are, what they are, how they are; and to give a clue to what is good, and what is bad for them; what is opportune and what is inopportune; and the effect that is likely to follow any proposed changes.

The following is a list of castes working at the Giridih mines, with caste occupation and present work:—

*A list of castes and caste occupations with the work they are actually doing at the East Indian Railway Company's Collieries, at Giridih.*

| No. | Names of Castes. | Caste occupation. | Present work at Collieries. |
|---|---|---|---|
| 1 | Ghatwars | Cultivators | Coal-cutters. |
| 2 | Mowlis | Basket-makers | Ditto. |
| 3 | Turis | Musicians | Ditto. |
| 4 | Bauris | Cultivators | Ditto. |
| 5 | Rajwars | Ditto | Ditto. |
| 6 | Poojahur | Ditto | Ditto. |
| 7 | Telis | Oil-pressers | Ditto. |
| 8 | Morrick | Silk-weavers | Ditto. |
| 9 | Pasi | Toddy-makers | Ditto. |
| 10 | Sunri | Spirit distillers | Ditto. |
| 11 | Kalwar | Shopkeepers | Ditto. |
| 12 | Mussahars | Labourers | Ditto and coke-makers |
| 13 | Dossadhs | Cultivators | Ditto ditto. |
| 14 | Chamars | Shoemakers | Ditto and labourers. |
| 15 | Kahars | Palki-bearers | Ditto and servants. |
| 16 | Hari | Sweepers | Ditto and sweepers. |
| 17 | Rajputs | Soldiers | Ditto and peons. |
| 18 | Dhobi | Washermen | Ditto and washermen. |
| 19 | Hajjam | Village barbers | Ditto and barbers. |
| 20 | Domes | Basket-makers | Ditto and sweepers. |
| 21 | Gwallas | Milkmen | Sinkers. |
| 22 | Burhis | Carpenters | Carpenters. |
| 23 | Chhutar | Ditto | Ditto. |
| 24 | Kamarkar | Blacksmiths | Blacksmiths. |
| 25 | Lohar | Ditto | Ditto. |
| 26 | Poddar | Money changers | Pump-fitters. |
| 27 | Beldar | Labourers | Navvies. |
| 28 | Coomars | Earthenware-makers | Tiles and cooking pots. |
| 29 | Koiri | Cultivators | Brick-makers and chapras |
| 30 | Khettri | Soldiers | Chaprasis. |
| 31 | Baman | Cultivators | Peons. |
| 32 | Kayasth | Clerks | Clerks. |
| 33 | Kaibartta | Cultivators | Ditto. |
| 34 | Kayets | Writers | Writers. |
| 35 | Baidya | Physicians | Medical staff. |
| 36 | Kurmi | Cultivators | Labourers. |
| 37 | Mundle | Oil-pressers | Ditto. |

| No. | Names of Castes. | Caste occupation. | Present work at Collieries. |
|---|---|---|---|
| 38 | Madak | Confectioners | Servants. |
| 39 | Halowai | Ditto | Ditto. |
| 40 | Bagdi | Coal-cutters | Cooks. |
| 41 | Keora | Swine-herds | Ditto. |
| 42 | Kandu | Shopkeepers | Shopkeepers. |
| 43 | Baniá | Ditto | Ditto. |
| 44 | Gareri | Shepherds | Shepherds. |
| 45 | Gosai | Priests | Cultivators. |
| 46 | Chandari | Cultivators | Ditto. |
| 47 | Mali | Gardeners | Gardeners. |
| 48 | Sonar | Gold and silversmiths | Gold and silversmiths. |
| 49 | Brahmin | Priests | Superior establishment under Europeans. |

In camp Neamuthpur, *vid* Sitarampur, 24nd April 1894.

The following is important evidence bearing on the various phases connected with employment in mines. It was given to me by two apparently well informed and educated natives, in reply to sundry questions I put to them.

Evidences of Durga Das Misra, 40, of Mohunpore, a Brahmin, Contractor for the Damuda Coal Company, has been also a Zemindary Manager. Also of Preo Nath Chowdry, 45, of Serampore, a Brahmin, Head Clerk and Cashier for Damuda Coal Company, at Sitarampur.

Bauris have no Brahmins.

*Castes.*—Bauris have no Brahmins.

Bauris dirty.

Bauris are a very dirty class of people.

Bauris.

They have no moral courage and have any number of wives, and a wife will leave her husband and take another; even if they lose their caste they can get it back by giving a feast.

To distinguish caste.

Bauris and Sonthals can be distinguished from each other by appearances and language; Sonthals are blacker and stouter than Bauris.

Which allow and do not allow females to work.

Bauris, Sonthals, and Domes allow their women to work in the mines, but Domes only seldom. Rajputs, Bhooas, and Rajoars do not allow their wives to go into the mine, even if they themselves cut coal; nor would they allow any of their females to go into the mine or even work on the surface of the mine; the same applies to the Mussulman. There is no objection for any caste to go down a pit, but they do object to the kind of work they do; that is, there is no real caste objection to going into the mine.

The Bauris do not, as a general rule, take young children into the mine.

who would as coal-cutters.

The castes that will work as coal-cutters are the Bauris, Sonthals, Keoras, Dhangurs, Haris, Chamars, Mussulmans, Domes, Mosahus, and Bhooas; and occasionally the Rajputs when of low caste. But the real Rajputs would not work as coal-cutters, nor plough land. There are ten or twelve castes who will work as coal-cutters, but the majority are Bauris and Sonthals.

Marriage.

Bauris marry early even as young as 9 years of age, and go to live with their husbands when as young as 13 years. Sonthals marry not younger than about 16 years, and go to live with their husbands as soon as they marry.

Sonthals and Bauris compared.

Sonthals will take their children and their whole family into the mine and shut up the house; as compared with the Bauris they are more suspicious of their wives, like to earn more money, and are more brave. They are open-hearted but more stupid, and not so cute as the Bauris. Bauris are of low

character and always try to cheat; this applies to a less extent to the Sonthals, the Bauris being more clever than the Sonthals.

Love their family.

The Bauris are not truthful, nor honest, but they love their wives and children, and have a general desire to make their families comfortable.

Original number of castes and duties.

According to the Shastras, there were originally only four castes among the Hindus, namely, the Brahmins whose business it was to read the Holy Books and guide the people in holy ways, and protect them by their teaching from sin.

The Khetries, the caste of the Kings who were to govern the people.

The Boysyos, who were the traders.

The Sudras who had to serve the other three by cultivating the land, and providing food, etc.

Husbands intend their wives to work when they marry.

*Women.*—Bauris and Sonthals appear to marry for the sake of earning money, and not to keep the family; sometimes the men even live on the earnings of their wives.

Women better workers than men and do more.

Women are good workers and work with better heart than the men, and are less lazy. Taking all the work that a mother has to do throughout the 24 hours, she probably does much more work than the man.

Women not compelled to work, the incentive.

Women work entirely of their own free will, the husbands do not in any way compel them to work; but they, more than the men, think of the gains and the means for keeping themselves and the family; and that causes them to wish to work so that they can make a comfortable living.

No restriction necessary.

There should therefore be no restriction as to place, time, or kind of work.

Work not injurious to women.

The work is not in any way injurious to women, they are rather benefitted by it; and are seldom diseased, much less so than the men.

Principal disease.

Fever is the principal disease, and women have it less than the men.

Women would suffer rom prohibition.

If women were prohibited from working in the mines, they would in various ways suffer more than at present. They would have to do *some* work, and would have to seek it; those with a baby would not be able to get work, and the women generally would suffer more from the want of food and in other ways.

Work in gangs or with relatives.

When the women do not go with their husbands to work—the widows and others,—they work in gangs, and the work is principally pit-clearing or filling out dust. They never work alone, and one woman would never go to work with one man other than her husband. They must either work in gangs with their families or with their relatives.

Not degrading to women.

Working in the mine does not in any way degrade the women or make them more immoral.

Effect of only married females being allowed to work.

If only married females were allowed to work in the mines, then the widows, and those whose husbands have left them, would suffer.

Work on surface harder than in mine.

Work in the mine is comparatively easy as compared with working on the surface. Some surface work is very hard, as, for instance, carrying coal to load the Railway wagons, etc.

Mothers.

Before having a baby they stop from hard work from one to two months, and the same after birth; but when they are very poor and without food in the house they have to work early.

Children ought to be taken in mines.

*Children.*—Women ought to take children into the mines, because there is no one else to take care of them. When they have children old enough to look to the small ones then they generally leave them at home.

Accidents to children.

An accident to a baby in the mine is almost unknown; we have never heard of any.

Mines healthier than miners' homes.

The mines are better and healthier than many of the miners' houses. They live, cook, keep, and do everything inside of their small house.

An ordinary miner's house is about 10 feet by 8 feet area, 5 feet high at the walls, and about 10 feet in the centre. The walls are generally made of mud, and sometimes of bricks. The roof cover is straw and bamboo, but

sometimes it is covered with "*khupra*" or tiles. In dry weather they cook and live a good deal outside, but they have filth and everything dirty near the house. Some keep goats and several other animals and fowls, and the filth also from the children is thrown about.

Children better in mines.

On the whole, the children are better with the mother in the mine than left at home.

Parents fond of children.

All mothers think a great deal of their children; fathers also think well of them.

Girls.

*Puberty.*—Girls come to the state of puberty at about 12 to 14 years, and even as low as 11 years. In some rare cases a girl of 12 years has been known to have a baby; but there being no record of birth, the age might be doubtful. A child of 8 years is fit to work. The miners will not go or work, and, especially, will not take their children where there is danger.

Age when fit to work.

Miners keep children from unsafe parts.

Should learn to work when young.

Both little girls and little boys should go into the mine early and become accustomed to carrying coals. Under-ground work does not do children any harm at all; the children that work grow up strong and healthy. If they do not learn when they are young, it will be afterwards difficult.

Education, and its probable effects.

It is questionable whether children should be educated, for it would, on the whole, make them more miserable; they would not afterwards work as coal-cutters, but try to get other work. The relations would blame them if they afterwards worked as coal-cutters, and say, "why did you get education and still work as coal-cutters." Those who can read and write will never cut coal; on the other hand, they take a most important attitude, and demand respect from everybody, and would not degrade themselves by such work as cutting coal, nor would they allow their wives or members of their families to work in the mine, or at most things about the mine.

Sirdars.

Those who have the charge of under-ground work should be able to read, and write, and report. The sirdars generally only have charge of the workmen, and are supervised either by Europeans or Babus.

Cannot compel them to work.

The people cannot be compelled to work in any way, especially on holidays or *purubs*; they can manage without house, almost without clothing, and have very little food requirements. People can go days without food, and they think little as to whether they live or die.

Cost to live.

*Cost of keep.*—Six to seven Rupees a month will keep a miner with food, clothing, and his grog; and R10. or R11. will keep a miner and his wife; and R1 to R1-8 should be added for each child. On an average a good coal-cutter and his wife would earn R12 per month, but some get as much as R15 or 20.

Cost to drink.

*Drink.*—Four to six pice will make a man drunk, and one or two pice worth of tobacco will suffice for a day for the whole family.

All smoke.

The whole family smoke, even children as young as 6 years.

[illegible]ew, but expensive.

The miners seldom chew "*pán*" or betel, because it is too expensive, but women of low character chew it more than men.

Females drink and smoke.

Nearly all females take intoxicating drinks more or less, some, especially widows, go to the shop for it; but husbands sometimes take grog home to their wives. Many women smoke the "hookah."

Saving money.

Women try to save, but men generally do not; but those who have money try to save more to it and go less to the grog shop, and work more regularly than those who have no money and do not try to save any. Those who have something try to better themselves and to become more respectable amongst their society, and to prepare for the marriage of their children. The costs for marriage, is in proportion to their state, but most of the money is spent in grog; if they do not provide grog the relatives will not eat; they will only eat when there is grog.

Kind of grog. The grog is to make them happy; the rice grog is the cheapest, and is that generally taken: "mewah" or fruit grog is preferred to rice grog, but it is more expensive.

Saving. In many cases as soon as a person has a little money, say 4 or 5 rupees, then he will try to save. Some of the ways of improving the people would be to encourage them to put money in Savings Banks, marrying better, living better, the feeling of having something, and being more respectable.

How to get men to be better. Something could be done in this way by having a good man in a village, or a good village headman who would live, and sit, and talk with the people, and set them a good example.

Caste prejudices. Caste prejudices amongst the Hindus *cannot* be broken down or changed. Amongst the Mahomedans it is not so strong, especially as to marriages; but the Hindus are very strong in this matter, and all the people go against those who change from their caste system.

Bengali Babus. *Bengali Babus.*—The amount required to keep the respectable class of Bengali Babus varies very greatly; the chief variations being in the kind of food, house establishment, and his charities. He has to insist on any person taking food with him that may come to the house; this is one of his most important duties as taught in the Shastras.

No public provision for those in want. It should be noted that in India there appears to be no establishments or charity organisations corresponding to the English workhouse, and Board of Guardians, or other public bodies, for relieving the poor from rates and taxes levied on the people.

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## Particulars of the mining people of Bengal, received in answer to questions, from Mine Managers who know the people well.

The spellings of proper names have been given as received, without alteration.

It will be noticed that the information varies with the local customs of the place from which the particulars have been gleaned.

The people in mining districts.

Character?—

"Sober, industrious, moral (in their standard); affectionate, but like children prone to quarrel, though the quarrels are soon made up. Not truthful, except they are not interested in the matter, then they are truthful."

"Domesticated and peaceable; indolent, moderate with liquor. Women do most of the hard work."

"Untruthful, dishonest, and immoral."

"The mines of Bengal are within the tropical zone, and the character of the native inhabitants is in many important respects greatly influenced by the geography, productiveness of the soil, and the warmth and moisture of the climate. The people require to be well-known to be properly managed, for the climate influences their habits of life, clothing, food, occupations, and structure of their dwellings. Warm and damp parts make them inert, feeble, less active and energetic than people in cold and dry parts of the country."

Principal Castes?—

"1. Mahomedans—Julahas (weavers), Kalals, Sheikh, Pathan.

"2. Hindus and Hinduised aborigines—Khars, Masahurs, Ghatwals, Dosadhs, Chamars, Toories, Rajwars, Bauris, Goalas, Pasi, Burhi, Moholis, Dhoby, Hazam, Koeris, etc.

"3. Aborigines—Sonthals, Koles, Kurmees, Malliks."

"Hari, Moochi, Kora, Dhangar, Bhooia, Mussalman, Dome, etc.

Social condition?—

"Good for them."

"Caste prejudices keep each caste separate from the other in their home life. The men and women depend for the most part on daily labour for their food."

"Very low and miserable."

Peculiar characteristics?—

"Easily controlled."

"They are very jealous of their women, especially Sonthals, who are also very clannish."

"Very fond of grog."

Stature?—

"As examples of all, the two following castes are given:—

| Caste. | Height. | |
|---|---|---|
| | Men. | Women. |
| Chamars | 5 ft. 4 inches | 4 ft. 10 inches. |
| Koeri | 5 „ $2\frac{1}{12}$ „ | 4 „ $8\frac{7}{10}$ „ |

"Average 5 ft. 7 inches."

"From 5 ft. to 5 ft. 6 inches high."

Colour?—

"From rich light brown of Goalas (Gopes) to black of Masahars and Koles."

"Dark brown."

"Black."

Form of marriage?—

"1. Child marriage among Hindus and Mahomedans, by 'Bartoo' or arrangement."

"2. Adult marriage, by Koles and Sonthals, and some Hindus. It is by 'Bihai' or making 'sindhur' marks on females' foreheads. This is the real marriage, and a man claims his wife on strength of it."

"3. 'Sagai' or marriage of widows, 'Rooksadi,' or 'leaving mother's home for husbands.'"

"On a propitious day the children are taken before a priest, the boy then puts 'sindur' on the girl's brow, the priest reading from the 'Shastras.'"

"The friends, relatives, and neighbours of the bridegroom and bride's father are invited during wedding and given plenty drinks. They play music, dance, and sing during drinking; females not excepted. On the wedding day the bridegroom with all his relatives, etc., go over at night to the bride's house where the marriage takes place before an altar, in the yard of the house, made for the purpose. The marriage is performed by the bridegroom rubbing a kind of red substance called 'sindur' on the forehead of the bride, when all present utter the name of their God for nine times. Both the bridegroom and the bride wear new clothes coloured with the turmeric supplied both by their father and father-in-law. The marriage ceremonies of all castes principally agree, but differ to a certain extent in details."

Strength of marriage tie?—

"Varies, although man has right of divorce in all cases. This divorce is more or less public, and must be *sanctioned* by the village or community sitting as panchayet."

"None, it all depends on the pleasure of the man; but as a rule, owing to the heavy expense, they keep to the contract."

"It is least strong, it may be at any time broken without any risk, at the option of either the husband or the wife."

Age of marriage?—

"Boy's age ranges from infancy to 15 or 16 years; girl's age ranges from infancy to age of puberty; oftener before but never after."

"For males, average 16 years. Females 12 years. Sonthal males and females marry at much higher age.

To what extent is the marriage bond recognised by law?—

"Recognised just as Scotch marriages were on evidence of the eye witnesses of 'Bihai or Sagai.'"

"These marriages are fully recognised by Courts of law as a legal contract."

"Law has very seldom anything to do with the marriage bonds, but it must recognise them when needed.

*Panchâyats.*—What they are, how formed, what they do, and how far their actions are recognised by the people and by law?—

"Panchâyets are assemblies of men of caste to settle caste questions; also of inhabitants of villages to settle village questions. This latter is mixed. Sometimes the former is entirely recognised by the people, and by law in some matters; but not by law if panchâyet presumes to settle matters cognizable by law."

"Panchâyet is a village or tribal Council composed of the head men of the village or caste, who arbitrate on any dispute. Their decision does not debar either party from recourse to law, but as a rule the people agree to them. Law cannot recognise the decision of panchâyet."

"They represent the intelligent and influential residents. Are nominated by police, and appointed by executive officers. They collect chowkidaree taxes in connection with their actions, and are recognised by the law and the people."

*Food.*—What is it, how many meals per day, quantity eaten?—

"Boiled rice and dâl, fried unleavened bread (*rotí*), and curried vegetables; meat and fish, occasionally. In one day a man eats 2lb rice and ½lb dâl."

"Dâl and rice. 3 meals daily (2 fresh, and one midday meal stale). One seer rice and 5 chicks dâl each person daily."

"Consists of rice, dâl, vegetables, fish, meat, etc., 1 seer or 2lb in each meal.

Cost of food?—

"Costs about annas 1 pies 6 per person per day. Rice 13 seers (about 26 lb) per rupee. Dâl annas 1 pies 6 per seer."

"Costs annas 1½ to annas 2 each person per diem; 11 seers of coarse rice for R1, and 11 seers dâl for R1 is the average throughout the year."

"Cost annas 2 per day per head. But this is subject to increase and decrease with prices of food. Per day, rice 0-1-3, dâl ½ pice, (salt, spices, oil, etc., 1½ pice), vegetables, etc., 1 pice."

Amount of rice grown on a bigah of land?—

"This varies very much. Say 9 maunds of unhusked paddy equal to 5 maunds of cleaned rice.

"1st quality land, 1 bigah gives 20 maunds of rice.

2nd " " " 10 " "

3rd " " " 5 " "

NOTE.—Rice is obtained from cleaning the husks from the grain in a "Dhakey," and from 1 maund of paddy 20 seers of rice is got." 1 maund=82lb.

"From 3 to 15 maunds of rice."

Amount of land generally allowed to each person for cultivation?—

"Four bigahs to sirdars and headmen.

Two bigahs to coal-cutters and sinkers." 1 bigah=120 ft. × 120 ft., or 14,400 sq. feet.

"One bigah to each family."

Kinds of drink taken?—

"Nothing but water. Grog on Sunday."

"Throughout the week, the miners drink water only. On Sundays they indulge in liquor."

"No other drink excepting water. Grog is almost daily taken for luxury."

Kind of clothing, amount, etc.?—

"Men—15 feet of thin white or grey cotton cloth, 3 feet wide. Two of these, one for dhoti and one for pagree. (Pagri.)

Women—18 feet to 21 feet of either Manchester or country cloth.

Childern—Generally none, except a small piece of cotton cloth about their loins, and as they grow up a cloth round loins. After 7 years of age, a cloth 12 feet to 16 feet in length."

"Men—12 feet of cloth feet wide.

Women—18 feet of cloth feet wide.

Children—Generally none at all. Others, a small piece of cotton cloth about their loins."

"Both country and English made cloth, 3 yards to 3½ yards for men; 4 yards to 4½ yards for women; and about 1 yard for girls × 1 yard. Cloth about 3½ feet wide."

"Children generally wear almost no clothes." (This applies equally to male miners, and to general labourers.)

Have they change for work and home?—

"Yes."

"Yes, also a change for festivals."

"Have separate clothing for work and home."

How often is new clothing required?—

"Twice or thrice yearly, generally twice."

"For men, 4 cloths a year. For women, 3 cloths a year."

"Two to three times a year."

Cost of new clothing?—

"Men—Dhoti 15 feet, R1-1-6."

Women—Cloth, R1-8-0."

Children—Cloth, annas 10."

"Coarse cotton cloth 0-2-0 per yard; finer quality 1-4-0 for a pair of Dhoties."

"For men annas 12. For women R1. For children annas 2 to 6."

Size of house?—

Varies.—About 10 feet × 8 feet, or 10 feet × 12 feet. Rooms—1, 2, or 3."

"10 feet × 10 feet inside measurement. One room."

"Some houses, 10 feet × 8 feet, 17 feet × 8 feet, 20 feet × 10 feet, with and without verandah."

Shape and construction?—

"Square and rectangular. One storey. Walls—mud; mud with wood, or with stone, or with bricks. Bricks. Bamboo, and bushes, etc. Roof—Sloping; thatched with straw, tiles, etc."

"Roofs—Sal posts, bamboo rafters, covered over with either straw or burnt tiles."

Furniture and cooking utensils?—

"Bedstead.

Earthenware pots for cooking—Karhai or frypan, kachul or spoon.

To eat with—Dubha or Kathoura bowl for rice. Thara or plate. Lota or pot. Glass (made of brass).

"No furniture.

"Brass bowl, iron pot, and earthenware pot."

"Charpoys made with 4 pieces of inferior wood with grass strings across them woven in a peculiar way. Palm leaf mats. Burnt earthenware pots, and several sorts of stone or brass pots or vessels."

Rent-free?—

"Yes."

Coals free?—

"Yes."

Tools free?—

"Yes."

Oil free?—

"Yes."

Bakshish?—

"No."

"Yes on weddings, poojahs, reward for good or special work."

"Frequently given on Sundays and holidays."

Other allowances?—

"Land at low rates.

Roofing materials supplied free.'

"Annas 9 weekly for men, annas 6 weekly for women and each child on the sick list. R1 for cloth for burial. R2 to R3 for child birth, when asked for.

Advances for private affairs."

"Allowances are given during marriages, births, and deaths."

Other provisions.

For accident?—

"Hospital.—One Assistant Surgeon and 4 Native Doctors. Doolies. First aid boxes. E. I. R. Co.'s colliery."

"Fed at Company's expense until convalescent. R1 weekly for family."

"Lasting provisions for accidents are very rare.

For sickness?

"Benefit fund as for accident."

"Men—As 9 weekly.
Women—As 1½ weekly and same for each child."

"Sick miners are allowed a little during their sickness."

For old age?

"None."

For widows?

"Allowed land rent-free until children can work, and any work in that village is given to the widows."

"Generally none."

"None."

For children when left in any way without support?

"No funds. As long as a man works for the E. I. R. Co. he has to support his children. If young, they live with mother; if older, with father."

"No funds. They work in the mine clearing dust."

"No provision for children when husband leaves wife, no public fund."

Longevity of the mining population.

Up to what age do men and women live?

"Some live to 60 years. Excluding children, the average length of life will be about 35 years."

"60 years on the average."

What is the average or most frequent age of death?

"21½ years is the average life of E. I. R. colliery population.
24 years is the average for the whole of India."

Females.

What do females work at in districts where there are no mines?

"Cannot say. The women round us (where there are mines) attend to household duties; collect cow-dung for manure; transplant paddy, husk rice, etc. But those who work in the mines do the same, the colliery then working short time to oblige them."

"Clear weeds from fields for farmers. Work in the town carrying bricks for building purposes. Gather wood, and cut grass for sale in the bazar."

"Work in the fields. Collect wood from jungles, and sell for fuel. Husk paddy. Make and sell cow-dung cake. Make flour. And generally assist their husbands in surface work."

What work would there be on surface for females prohibited from working in mines?

"Practically nothing, except loading coal, and their own household duties."

"Hardly any, because the work on surface is already occupied and being done by other women, etc."

"Females prohibited from working in mines would have to try to get a share of the above surface work."

Education.

What proportion can read or write?

"Census of 1891 gives 212 (work people and children) out of a population of 8,000."

"None."

"One in a thousand can hardly read and write."

Do any possess, or read books or papers?

"The boys."

"No."

"None have papers or books.

Who does their writing?

"Lallas or Kaiths at 4 annas per letter. Our school boys do this now."

"They never have any occasion to write, the males attend to this."

"Writing is very seldom required, and if required it is done by some villager who knows it."

As to prohibiting young children from mines, ought school accommodation to be provided at the same time?

"I think so."

"No, because it would unfit them for manual labour, make them despise their parent's work, and create discontent amongst all."

"School accommodation ought to be given."

Arguments for and against education of miners?

"I see none against it. Several of my boys have left school to cut coal, to do sinking, and work in the workshops."

"The time is not yet ripe, nor are their surroundings in keeping with education. If it is introduced, it must be voluntary, and not compulsory."

"Education may make them honest and moral, but they will dislike work other than reading and writing."

What do their religious ceremonies consist of?

"Chiefly the worship of "*Kali*," especially in case of epidemics. Also *Dewan Sahib* to whom they vow goats when in trouble. When trouble is over (it may be debt. or sickness, or strayed cattle) the vow is carried out. Mahomedans and Hindus both worship these. Mahomedans pray as ordered."

"In propitiating the favour of their God *Kali* by sacrifice of goats. Each village and caste has its Pepul tree under which the men place large stones, and on special occasions, such as sickness in the family or death, they deck the stones with red paint, "sindoor;" and kill a goat which they eat, the priest or 'Koormi gets the head and skin for his trouble."

"The ceremonies consist of sacrificing goat, sheep, pig, and cocks before ghosts which they mostly worship."

To what extent does religion regulate their life and work?

"To as slight extent as Christianity regulates an ordinary Christian's life. Spirits—Bhoots—control their life to a great extent by fears."

"None, except observing festivals or poojahs, and ceremonies observed on a death."

"It does not regulate their life and work in any way."

To what extent does caste regulate their life and work?

"Entirely."

"This would be serious if interfered with, not otherwise."

"In some cases castes regulate work to a certain extent, such as a Bauri will never work as a sweeper or shoemaker, and *vice versâ*."

What is the character of the people as to doing anything contrary to the rules of their religion or caste, or things new to them, or in a new way?

"They can do anything against the rules of religion except sacrilege. But caste rules tie them down tight, yet it is all a question of being caught."

"Most obstinate and clannish. I believe there are many who could be worked up to suffer death, and there are many agitators eager to take advantage of such an opportunity."

"It is the long established custom and usage."

Do the people change slowly. Can they be got to change, and adopt new methods of living and working by a slow process?

"Anything that does not affect rules of eating, and drinking, and marrying, can be quickly learned and adopted by them."

"History and the country answers the first—very slowly. I do not think they could be got to change or adopt new methods of living, as they have found out the truth of the proverb that "A man is rich according to his requirements." Besides they are independent, for three months' cultivation during rains yields sufficient food for the family to live on for the rest of the year.

Change of working they may take to if they saw any advantage to be gained by it."

"The people can be got to change their mode of living and working gradually."

Peculiar characteristics.

*Supplementary.*—Their habits of life are simple, and most things that are necessary to Europeans are quite unnecessary to the Bengal native. They were pithily described to me by an old fatherly priest who said: "they are people who rely on the sky for a topi (hat); the sun for heat; the ground for a seat and bed; and the fingers for spoon, knife, and fork; many only clothe themselves, even with the morsel of clothing they use, because the law compels them; and if you give them a chair they *sit on it*, squatting with their feet on the seat." Even the Babus, and others who are looked upon as being high in the social scale, either sit on their heels, or crossed-leg like a European tailor whilst writing, and have the paper or book on the floor; or if the writing material is on a table they will then sit *on* the table in the same way. This is the general custom of the country, even a dealer in a native shop, or bazar, will sit on his stall or counter right in the midst of the fruit, food grain, or anything else he may be selling. It is at first curious to see how many can use the feet for some purposes almost as well as their hands.

Clothing.

The people in the mining districts of Bengal are able to exist with the smallest amount of clothing habitually worn by any of the human race. What they do wear is cotton fabric of varying texture, and is put about their body in an elaborate series of folds, almost covering the females from head to just above the feet, without any stitching, pins, buttons, hooks or eyes, tapes, or knots. And they neither wear stockings nor shoes.

Influence of Religion, and Caste.

Religion and caste influences and dictates the practices and observances of daily life to a much greater extent than does christianity in European countries. Hinduism is especially distinguished from all the other religions by the degree in which it penetrates into and regulates the social relations and domestic habits of its adherents, and also the rigour with which it enforces its decrees. It regulates marriage, food, and drink, both as to time and manner of eating and drinking, by whom it is cooked and served, and the kind of vessels to be used, and with whom it shall be or shall not be taken; also kind of work and many other things. The high caste Hindus must not even be touched on any part of the body, by any person whatsoever whilst eating.

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Question of child and female labour. Subjects for further information.

## 44. Information sent to Inspector of Mines, by the Indian Mining Association.

To—JAMES GRUNDY, Esq., Inspector of Mines in India.

The Indian Mining Association on the question of child and female labour.

Questions sent on the 8th and 12th June 1894.

Answers received on the 28th June 1894.

1. The extent to which the Association represents Indian Coal Mining? The proportion of the whole mining population employed by them? What proportion of the whole Indian output is theirs?

The Association represents all the European Capital in Bengal with the exception of one Company lately started. The native proprietors would, it is believed, join, but they are for the most part small owners who don't see their way to pay the subscription. (The E. I. R. Co.'s Collieries are also outside of the Association.)

Parts 2 and 3 of question 1 cannot be answered in the time at our disposal, they are purely statistical and the information can be got from the last census returns as regards the first; as regards the second there must be publications in the Geological office, or in the Statistical office, giving the information.

From census report of 1891 :—

Coal miners are found in the following three districts of Bengal.—J. G.

TOTAL POPULATION.

| | Males. | Females. |
|---|---|---|
| Burdwan | 682,872 | 709,008 |
| Manbhum | 593,199 | 600,129 |
| Hazaribagh | 566,964 | 597,357 |

MINERS.

| | Total. | In 100,000 of population. | Per cent. |
|---|---|---|---|
| Burdwan | 16,171 | 210 | 0·259 |
| Manbhum | 127 | 1 | 0·001 |
| Hazaribagh | 14,712 | 317 | 0·317 |

2. What is the total number of persons employed by them below—ground and above—ground? What is the additional number they are quite ready and wishful to employ if they could get them, males, also females?

| PERSONS NOW EMPLOYED. | | | | EXTRA NUMBER WANTED. | | | |
|---|---|---|---|---|---|---|---|
| ABOVE-GROUND. | | BELOW-GROUND. | | ABOVE-GROUND. | | BELOW-GROUND. | |
| Men and boys. | Women and girls. | Men and boys. | Women and girls. | Men and boys. | Women and girls. | Men and boys. | Women and girls. |
| 4,889 | 4,140 | 9,900 | 3,818 | 5,242 | 2,393 | 8,998 | 4,372 |

3. The number of tons of coal raised in the year, or half-year; and the increased quantity they wished to have raised, and could have sold?

Examples of any real difficulties suffered by industries for want of the additional quantity of coal?

Quantity raised yearly about 1,300,000 tons. Quantity which could have been raised, say ⅓rd as much again.

The universal difficulty of having to pay much higher rates for their coal; as supply falls off, so does price rise.

4. What proportion of the coal raised, and wished to be raised, has been and would have been used in India?

Practically speaking all. That is in Bengal, Nor'West, Bombay, Madras, Coast Ports and Burmah.

5. What is the estimated total daily, weekly, monthly, or yearly wages earned belowground by females at the Associations' Mines?

Would the poor people be poorer by about this amount?

| | R | a. | p. |
|---|---|---|---|
| Average daily wage earned by a woman below-ground | 0 | 3 | 0 |
| " " " girl " | 0 | 1 | 10 |

It should be noted that the under-ground labour force is irregular in attendance, and the whole number do not come to work daily.

The above are not the particulars this question asked for.

6. At what age is the Association willing for children being prohibited from going into mines?

The Association are not willing for any limit of age.

7. How could the prohibition of females and children be best brought about?

Too full of danger to attempt.

8. *Managers.*—How many kinds of certificates should there be? And what names would they like to be adopted from—Agent, General Manager, Manager, Assistant Manager, Under Manager and Assistant in charge?

Could be settled in conference. Manager, 1st class certificate, Assistant Manager, 2nd class certificate, seems most popular.

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45. To—JAMES GRUNDY, Esq., Inspector of Mines in India.

No. 27, Chowringhee Road, Calcutta.

Character?

Careless and working only to live.

Principal castes?

Bowries and Sonthals.

Social conditions?

Regulated mainly by caste. The family tie is very strong and enters into every undertaking.

Peculiar characteristics?

Want of thrift. Proneness to take fright, attachment to old customs and conditions. General "Shoeplike" proclivities.

Stature?

Average man will be about 5 feet 6 inches to 5 feet 9 inches.

A small and an average woman measures to-day 4 feet 7½ inches and 5 feet 2 inches.

Colour?

Various shades of brown.

Manners and customs.

Form of Marriage?

Seldom have legal Hindoo marriage. Men and women of a neighbourhood are collected, they dance together, the parties intimate they are married, and then follows feasting and drinking.

Strength of marriage tie?

Very weak among Bowries of Raneegunge division. Said to be strong among Sonthals.

Age of marriage?

Among the Bowries male is generally an adult, and female from 10 to 16 years old.

To what extent is the marriage bond recognised by law?

The regular form of Hindu marriage is recognised by law, but not this form.

Punchayats.

*Punchayats.*—What they are, and how formed? What they do; and how far their actions are recognised by the people and by law?

The modern punchayat consists of a few headmen of the village, who are appointed by the Magistrate. Their duties are to look after the Chowkedar and collect the Chowkedari tax. They are responsible to the Magistrate for disturbances of the peace.

I have seen a spurious punchayat in the collieries, where some of the leading men of the village sit in judgment on one who has offended, fine him, and drink the proceeds.

Food.

What is it, and how many meals per day, and quantity eaten?

Rice with dall and coarse vegetable. Two meals.

One meal=½ seer rice, 2 chittacks dall, ½ chittack salt. (4 chittacks meal, but only used rarely.) (Def.—1 Chittack=2 oz.—J. G.)

What does it cost for one person?

6 pice per day.

Price of each article of food:—

1 seer rice=5 pice, 1 seer dall=4 pice;
1 seer salt=7 pice, 1 seer meat=2 annas;
1 seer fish=5 annas, 1 seer potatoes=6 pice (4 chittacks to a meal); mustard oil for body=1 pice daily.

How much rice can be grown on a bigah of land?

10 maunds of chaul or cleared rice.

How much land is generally allowed to each person to cultivate?

One bigah, with 5 cuttas garden land round his house.

Drink.

Anything but water drunk, and occasionally grog as a luxury?

(1) Mahua liquor—4 annas, 8 annas, and one rupee a quart.
(2) Rice liquor—4 pice for a drink, 2 annas intoxicates.
(3) Toddy liquor—4 annas for large serai full.

(Def.—Mewa liquor is various kinds of fruit drinks.—J. G.)

Clothing.

Kind, material, and amount of clothing for men, women, and children—

Large doti to cover shoulders, 4 yds. × 1 yd. Ordinary doti about 2½ yds. × 1 yd.

Women—

In one case 6 yds. long, 31 in. broad, length may vary by a yard or two.

Children—

Generally none, or a string round waist to which is suspended a small rag that just covers their nakedness.

Have they a change of clothing for work and another for home?

After washing they have generally clean clothing to put on.

How often is new clothing required?

Men—English cloth every 3 to 4 months. Bengalee cloth every 5 months.

Women—2 pieces English cloth last a year. One piece Bengalee cloth 6 months.

Cost of new clothing—

Men, women, and children.

Men—Small doti 8 annas, large doti 13 annas.

Women—May run to some slight expense in choosing an ornamental cloth.

Average sarees = Re. 1-2 to Re. 1-10.

House.

Size—

14 ft. × 10 ft. upwards.

Shape and construction—

Square, rectangular, one storey.

Walls, mud or brick.

Roof—sloping, thatched with straw or roofed with tiles.

Rooms—one or two.

Furniture.

Furniture, and cooking utensils—

A charpoy or two.

Brass and earthenware eating, drinking, and cooking utensils.

Allowances.

Rent free?

Yes.

Coals free?

Yes.

Tools free?

Yes.

Oil free?

Not free.

Bakshish—

Occasionally during poojahs. (Def.—"Bakhshish" is a gift or present.—J. G.)

Other allowances—

Kárákee in cases of sickness or injury.

Other provisions.

For accident—

Get kárákee.

For sickness—

Get kárákee.

(Def.:—"Kárákee or "Khúraki" is a daily allowance of food or money."—J. G.)

For old age—

Light work generally found for old people—a few are pensioned.

For widows—

Widows whose husbands have been killed in the pits get kárákee. They generally work in gangs as dust women, not having husband to work with.

For children when a husband leaves his wife, or divorces her; or is unable, or too lazy to keep them. Any public funds for this, or how are they provided for?

No poor law in Bengal. The family tie is so strong that it provides for the sustenance of destitute relations.

Longevity of the mining population.

Up to what age do men and women live?

70 or 80 years of age.

What is the average, or most frequent age of death?

Roughly about 50 years.

Females. What do females work at in districts where there are no mines?

Light agricultural work, drawing water, cleaning cooking utensils, and cooking food.

What work would there be on surface for those females prohibited from working in mines?

Little or none. In Raneegunge a few might be employed by Potteries and Paper Mills.

Education. What proportion can read or write?

A very small proportion.

Do any possess, or read, books or papers?

No.

Who does their writing?

A Babu or any one who writes.

As to prohibiting young children from mines, ought school accommodation to be provided at the same time?

We do not want any prohibition.

Arguments for and against education for miners?

Once educated, they never consent to begin life as working miners, but swell the army of unemployed clerks.

Educated, they are protected against and tend to break down the privileged class of Babus, who work into each other's hands.

Religion. What do the religious ceremonies consist of?

Prayers, music, dancing, etc.

To what extent does religion regulate their life and work?

Like most nature worships it enters into almost every act of their lives.

Caste. To what extent does caste regulate their life and work?

To a very great extent. Entirely.

Changes. What is the character of the people as to doing anything contrary to the rules of their religion, or caste; or doing things new to them, or in a new way. Are there some who would readily suffer death rather than do anything they object to?

They become fanatical if expected to break their religion or caste; and most preverse if asked to break their dastur or custom. In fact many won't do it.

I have no doubt there are many ready to suffer extremities for their religion.

Do the people change slowly. Can they be got to change, and adopt new methods of living and working by slow process?

The history of the country shows that the people may be made to change slowly. Such changes must be very judiciously introduced and carried out equally judiciously.

## 46. Indian Mining Association.

*A Special General Meeting of the Members of the Indian Mining Association was held at 3 P.M. on Wednesday, the 20th June 1894, at the Bengal Chamber of Commerce, to discuss the contemplated introduction of a Mines Act into India, and the possibility of interference with the present labour system in the Mining districts.*

There were present:—

| | |
|---|---|
| C. W. Gray, Esq., *Chairman, Presiding* | *Bengal Coal Co., Ld.* |
| Geo. Lyell, Esq. | *Equitable Coal Co., Ld.* |
| J. Gemmell, Esq. | *New Beerbhoom Coal Co., Ld.* |
| E. Cable, Esq. | *Burrakur Coal Co., Ld.* |
| J. R. Black, Esq. | *Damuda Coal Co., Ld.* |
| E. S. Bennertz, Esq. | *Damuda Coal Co., Ld.* |
| A. A. Apcar, Esq. | *Sitarampur Collieries.* |
| J. McCabe, Esq. | *Borrea coal Co., Ld.* |
| R. P. Ashton, Esq. | *Raneegunge Coal Association, Ld.* |
| F. J. Porter, Esq. | *South Burrakur Coal Co., Ld.* |
| Babu Ram Chunder Banerjee | *Baraboni Coal Co., Ld.* |
| C. R. S. Walker, Esq. | *Bengal-Nagpur Coal Co., Ld.* |
| J. D'Arcy Evezard, Esq. | *East Indian Coal Co., Ld.* |

The following gentlemen attended by invitation :—

| | |
|---|---|
| Jas. Grundy, Esq. | *H. M.'s Inspector of Mines in India.* |
| Dr. Wm. King | *Director, Geolgical Survey of India.* |
| Allan Arthur, Esq. | *President, Bengal Chamber of Commerce* |
| A. Simson, Esq. | *Messrs. Kilburn & Co.* |
| D. F. Mackenzie, Esq. | *Messrs. Macneill & Co.* |
| W. J. M. McCaw, Esq. | *Messrs. Ketilewell, Bullen & Co.* |
| Shirley Trembarne, Esq. | |
| J. C. MacGregor, Esq. | |

The Chairman in opening the proceedings said :

Gentlemen,—Our Committee of the Mining Association have called this Meeting in order to introduce Mr. Grundy, Her Majesty's Inspector of Mines in India, to those who are interested in Mining enterprise in Bengal. Before I go further, I ought to mention that Mr. Grundy has no intention of speaking at this Meeting, but comes among us as one seeking information.

Mr. Grundy arrived in India last cold weather with a commission to inspect Mines, all over India, and in due course to report with recommendations as to the mode of working such Mines with regard to the safety thereof, and with regard to the conditions under which the Labour worked. This appointment appears to have been the outcome of an International Labour Conference, which met in Berlin, in March 1890, and of the statement of the British Delegates to the following effect :—"That they could pledge themselves for "Great Britain, that their Government, faithful to its action in the past, would conform "resolutely in the future (if it did not even go beyond them) to the benevolent principles "of the Conference."

The work of the Conference was to consider Mining conditions as they existed in all the European nations, but India was not represented, nor, as far as I can ascertain, was India even referred to, in the course of the proceedings. It *is* a fact, however, that the Under-Secretary of State for India (Sir John. Gorst) was one of the British Delegates.

In the letter of instructions sent to the British Delegates by the Foreign Office, I find the following words :—"The whole subject is one of the deepest importance and every "proposal which promises an improvement in the condition of the great multitude of men "who live by labour in Mines or Factories will naturally receive the most attentive con- "sideration at your hands."

From this we may conclude that the sole object of legislation to be undertaken in India is to improve the condition of the Mining population, but when benevolence strives to commend itself by vexatious and unsought-for methods, it is no longer benevolence but persecution. We have not had the advantage of a definite expression of his conclusions but in the course of the last few days, members of the Mining Committee have had various Conferences with Mr. Grundy and the opinion which we have formed, is, that he is quite convinced that legislation is necessary with a view to securing greater safety in the working of Mines, and that boys under the age of 10, and girls under the age of 12, should be prohibited from going under-ground. He does not seem to be *quite* prepared to admit that the labour of adult women under-ground is a necessity, but I trust he is open to conviction. He asks for "facts and not statements" and I trust, our Secretary's replies to various minute questions which Mr. Grundy has put us, will help to supply this want.

Nothing has occurred in the past history of Mining in India, which in any way justifies or points to the necessity of Mining regulations, but as reasonable men, who are justly anxious to secure the safety of those who work for them, I *believe* I express the general feeling of this Meeting when I say that it will not seriously oppose the creation of such regulations, provided always they are devised with the assistance of men qualified by Indian experience, are in accord with the conditions of Mining here, and are not unduly expensive.

But I am *sure*, I express the feeling of this Meeting when I say that they will strongly oppose any interference with the Labour force.

I presume that those who are desirous that reforms on the Berlin Lines should be carried out in India, are under the impression that the habits and customs of the Indian Mining female resemble those of the European Mining female; by no other means can one account for this agitation.

Mr. Grundy will be supplied with particulars in this respect which, combined with his own personal observation, cannot fail to convince him that this is an utter fallacy.

That fact being admitted, the conclusion comes naturally that, what is a benefit to one may be a bane to the other.

Surely we, who have been so long engaged in Mining work in India, should have heard of it, if dissatisfaction were felt? If the women and children were exposed to hardship and danger, they would complain. No compulsion is brought to bear on them. They come or stay away as they please.

Indeed, my experience of the native character, leads me to say that the fact, that there *are* women working in the Mines, is emphatic evidence that their tasks are tasteful to them, otherwise they would forsake them without asking anybody's leave. At present the miner and his family work in unison and contentment, they share the labour and they share the wage. The wife and children do the light work, and at the same time keep an eye on the smaller members of the family, keeping them out of mischief and readily attending to their wants. In a Memorial, which the Coal Proprietors in Bengal submitted in December 1891 to His Excellency the Viceroy, they set out at some length the hardships, etc., to which the Labour would be exposed if legislation on the lines contemplated were introduced, and the danger which threatened the trade, and in fact the whole country, should the Labour become unsettled. There is little to add to that Memorial, and I *think* it; and his personal observation, has caused Mr. Grundy to modify matters, and that he intends to reduce his requirements for total exclusion to children of certain ages. Mr. Grundy says, that we ought to have more regard for the safety of children of the tender ages mentioned, but I don't think he is able to mention a single accident which has overtaken a child, and, if under existing circumstances the immunity has been so great, how much will it be enhanced, when the Mines are safeguarded on scientific principles!

Mr. Grundy also says, that only a very few children below the ages mentioned, are to be found in the pits, and argues that in consequence, the unsettlement caused by total prohibition would be trifling, if in fact, it were to occur at all, but this fact seems to me to be arrayed against him, seeing that being so few, it is needless to run the risks legislation on their behalf would expose us to?

Nor am I disposed to agree with him as to the gravity of the disturbance likely to ensue. If these children are to be excluded from the Mines, what is to be done with them? A boy of 10 in India is generally what may be termed "well advanced for his age" and a girl of 12, is in 9 cases out of 10 a *woman*.

It is not likely that the parents of these children will leave them to their own devices on the surface. They will go to look after them, and those left in the pit without encumbrances of the sort at the moment, will probably follow, thinking that their day may come.

A native always views with suspicion any interference of a personal description with himself or his belongings. He does not understand it. His mind is unable to appreciate the benevolence which seeks to render him happier by interfering with his "dustoor", that is by breaking up the usages which have been handed down for generations from father to son. On the contrary, he seeks for a motive. He asks "why does Government put interdictions on my children? They have some end in view, perhaps my children will be taken from me! He consults his old men, his gurus, even more conservative than himself, gets no satisfactory explanation, and finally, without a word of warning, bolts and takes his gang with him.

The Mining population is too meagre and the necessity of training up the miners' children in their parents' footsteps, too pressing to permit of our viewing projects of this description, based as they are, upon western ideas, except with the gravest apprehension. In spite of the redundant labouring population, which there is said to be in other parts of the province, languishing for employment, *we* feel only too keenly the scarcity of labour in our Mines. On its account the proper development of the Mines is retarded. In the more isolated districts, such as Giridih, the push is not so much felt, but in the localities from Barrakur downwards, where the collieries are very numerous and closely grouped together, it is not an unusual thing to find that a gang of men who have been working for *you* one week have been induced to go and work at another colliery, a few miles off the next?

What encouragement is there to lay out a Colliery, to raise a large quantity of coal monthly, when it is only possible to find labour enough to cut a fourth part of it, or what encouragement is there in sinking a new pit to be filled with labour on its first opening at the expense of the older pits in the neighbourhood? It will occur to us, that what we ought to do under such circumstances, is to seek mechanical means for coal-getting, so

we shall no doubt, in time, but our cry all along has been, "We are but commencing to assert ourselves, do not harass us, and by so doing stifle our power of usefulness."

Candidly speaking, Government would act far more equitably, if, instead of scheming to protect our labour against us, they sought to protect us against our labour.

With this trouble hanging over us, the Committee will have to consider seriously whether in future tenders, etc., we should not insert a clause to the effect, that should this legislation come into operation, the tenderers will hold themselves at liberty to revise the rates, and cannot be responsible for irregularities in deliveries.

Finally, Gentelemen, I have to say, that I fail to see how, from any point of view, we can possibly agree to a movement which will cause positive hardship to those it is intended to protect, which will increase the expenses of coal-getting by fully 50% and will, in similar proportion, add to the difficulties of all the industries in the Empire.

Mr Allan Arthur, President of the Chamber of Commerce, said :

MR. CHAIRMAN AND GENTLEMEN.—It seems to me that the enquiry, which Mr. Grundy has been making on behalf of the Secretary of State into the working of the Coal Industry of India, may result in an attempt being made to force a Mines Act upon us totally unsuited to the conditions under which work is carried on in this country. It behoves us, therefore, to be specially watchful. This enquiry seems, to me, to resemble so closely other Commissions and enquiries, which have been forced on India during the last few years, that I think the time has come for us to make a very vigorous protest against the policy of systematic dictation and interference which the Home Government has adopted in connection with many Indian questions, and seems to wish to continue until pulled up by some such occurrence as that undignified scare which took possession a few weeks ago of a portion of the people of England, and which the *Times* with some degree of truth ascribed to their consciences making cowards of them.

In making these remarks, and in anything I am about to say, I trust Mr. Grundy will not consider that I intend any discourtesy towards himself personally. On the contrary, we are very glad to see him, and I trust, and feel sure, that during the investigations and enquiries which he has been making on behalf of the Home Government, he has been given willing assistance by every one connected with the Indian Coal Trade.

Some people at home, who clamour for legislation on Indian questions, comfort themselves with the thought that it is philanthropy, which is at the bottom of the interest they take in Indian affairs. Why they should arrogate to themselves a higher position in the moral scale than they give to us, is difficult to understand, for I think we can claim that our hearts are just as warm as their hearts, and if the native workers in our Factories and our Coal Mines have grievances, the Government of India is quite humane enough to enquire into these grievances if they exist, and are just as competent as the Home Government to devise means to mitigate these grievances if they exist. We here do not believe that philanthropy has much to do with the desire in England to legislate for India, and have the idea, that a great deal of the dictation which the Home Government takes upon itself to display in regard to Indian matters has for its foundation a desire to catch or save votes at the next General Election.

We of course do not know what recommendations the Home Government may make to the Government of India, in connection with Mining Legislation for India, but I can safely say that any interference with Labour in the Indian Coal Mines will come hardest on those whom such legislation is brought forward ostensibly to benefit. As was the case, when the Factory Act was passed, the greatest sufferers will be the labourers themselves. If present customs are attacked, a family will make less than they do under existing conditions and the withdrawal from a family of even a single rupee per month will be an immense hardship on the family system of working.

While the workers will be the chief sufferers by Labour Legislation, such hardships will of course reflect on the trade generally. Labour Legislation will mean the crippling of the Indian Coal Trade to a more or less degree, and in this connection, I would say, that the capital, which is invested in Indian Coal Mines and which is principally British capital of the capital of British subjects, has as great a claim for consideration and protection as the capital of Mine owners in England. But all the protection we ask, is to be left alone, so far as the Labour question is concerned, and not to have European conditions applied to Indian subjects.

It is no secret that when the Factory Act was brought forward, Lord Lansdowne and the Indian Counci received instructions from the Home Government to pass a much more

stringent Act than that which was ultimately passed. But Lord Lansdowne had the good sense and courage to say that he would not follow these instructions.

The result was a compromise, of which the Indian public did not approve, but in which they tacitly acquiesced. In the present case, however, we are inclined for no compromise as regards Labour, and if similar instructions come out from England with regard to Mining Legislation as came out with regard to the Factory Act, not only this Mining Association which will be backed up by the Bengal Chamber of Commerce, but I venture to say the whole non-official public of India will, with no uncertain voice, recommend Lord Elgin and his Colleagues to maintain a firm attitude and refuse to be dictated to by the Home Government on the Labour question.

We feel that an attack upon the coal industry of Bengal, means an attack on every industry in Bengal in which coal is used, and such being the case, it is not to be wondered at, that we are prepared to resist with all our strength any blow aimed at the Bengal coal industry.

It is not for a moment to be supposed that those interested in Bengal coal, object in any way to a code of Mining Regulations for the safety of workers being passed and brought into law, but such regulations should be drawn up with a view to suit local conditions, and surely they can be formulated more suitably in India than in England. We will strongly object to any legislation, which has for its object the benefit of Proprietors of Coal Mines in England to the detriment of Proprietors of Coal Mines in India.

I should like to add a word to express my personal feelings in regard to this dictation from England on Indian questions. I positively blush for those of my countrymen in England who, under the plea of philanthropy, clamour for legislation for the industries of India, which, as a matter of fact, they know to be against the industries of India. To my mind it is like stabbing a man in the back.

Mr. E. Cable, Burrakur Coal Company, Limited, said:

MR. CHAIRMAN and GENTLEMEN,—I am sure we are all of us much obliged to Mr. Grundy for allowing us this opportunity of giving him our views on the proposed Mining Legislation before he reports on the matter to the Home authorities. It seems to me that his courtesy in this respect, is to some extent a guarantee that local opinion will be amply consulted before any actual laws are passed, meanwhile, it remains for us to agitate with all our might against proposals, which as they now stand, are a menace to the development of mining enterprise in this country. Considering that we are all of us (as far as I know) unanimously against any proposals, having for their object any interference with our labour, and after the very full manner in which our Chairman and Mr. Arthur have placed the position before you, there appears to be very little more to be said on the subject at its present stage, but perhaps I may be allowed a few words on the labour question generally.

We are employers of Labour, not only in the colliery districts, but also at every important traffic centre from Delhi to Howrah and from Chitpore to Goalundo, so that I suppose we may claim to have a somewhat extended knowledge of the conditions which conduce to the successful management of large bodies of labour in the country. Well, Gentlemen, what are those conditions?

The two most important of them are very simple, firstly, we must allow our labour the most perfect freedom to leave our service or to join it, just as the whim seizes them, and secondly, we must on no account interfere with their family customs and caste prejudices.

Let me give one small illustration, more for Mr. Grundy's information than your own of the numerous fads of labour in this country with which we have to put up. Mahomedan coolies at Goalundo will not carry bales of hides at any price, but the same men will carry those same bales at the Calcutta jetties not only without a murmur, but as a matter of course. It is needless for me to tell you what would happen if we were to attempt to force our men at Goalundo to carry those hides, as of course a general stampede would be the result.

This is only one of many of those customs and prejudices of Indian labour with which we all of us in this country know how impolitic it is to interfere, and yet, Gentlemen, our friends at home actually propose to enforce wholesale alteration of long established customs upon the entire mining population with what immediate result, I for one would be unable to predict.

There is only one other question which occurs to me at the moment, and that is,

whether we should not at once consider these mining proposals from our customers' point of view, and warn them of what the result may be, if restrictions are placed upon labour.

Speaking for my own Company, the Managers, both men of experience and ability calculate that the cost of coal will be raised by Re. 1 per ton, if women and children are to be excluded from mines, besides which our outturn will be diminished by one-third and the standing charges falling on a smaller outturn, would further increase the cost in all by Re. 1-2 to Re. 1-4 per ton. This increase to the Eastern Bengal State Railway alone would mean 1 lakh of rupees a year. It seems, therefore, that we owe it to our customers to notify them at the earliest moment of what is looming ahead, and, possibly, they also may make their own independent petition to the Government on the subject.

Mr. A. Simson, Messrs. Kilburn & Co., said:

I have not come prepared with a speech or facts, but I agree entirely with every thing that the Chairman, Mr. Arthur, and Mr. Cable have said, and the facts that they have brought forward, which are known to me of my own knowledge. The only thing I would further point out is the extremely wide-reaching effect of any increased cost in the output of coal. I regard it as of greater importance than the omission of the cotton duties or anything of the kind, for it means the raising of the cost of transport throughout India. It may check the exports of the country and do trade the greatest injury it is possible to conceive. In a corresponding manner it will check the industries which are growing up. Beyond the ordinary industries of jute and other manufactures, such as cotton spinning, indigo planters all depend on coal, and so do the railways. In fact hardly any portion of the country will be untouched. I entirely agree with what Mr. Gray said when he remarked that a girl of twelve was practically a woman and very often she has a family of her own. With regard to age, I would say that children ought not to be forbidden from going in to the mines at all. Mothers take their children into the mines from the very earliest age, and besides looking after them do their labour all the same. It does not occur to me to refer to any other point, and I would only confirm everything said by the gentlemen who have spoken before.

Mr. J. Gemmell, New Beerbhoom Coal Co., Ld., said:

GENTLEMEN,—We are much obliged to our Chairman for the clear manner in which he has introduced the subject before us to-day. It is to be regretted that so little time has been given to our various members for obtaining facts to bring before Mr. Grundy, before preparing his report. It was understood, that before issuing it and after his inspection at the collieries he would give the Coal Companies in Calcutta full opportunity to confer with him in regard to the views he had arrived at. More especially, as the owners may be said to be resident in Calcutta and it is they who are in complete touch with the commercial community and are therefore most interested in the development of the industry. This, however, is the only opportunity which has been afforded to us to confer with Mr. Grundy on the subject. True, two members of our Committee had a short interview with him last Friday, but beyond that we have not had the opportunity of giving him our views on the subject. We, therefore, think it premature for him to send in his report without knowing what our views are, and giving us the necessary time to obtain full details from the collieries, and at the same time giving us the benefit of his experience at the collieries, so that with a joint discussion a favorable measure may be evolved. The Meeting to-day, we hope, will simply be the preliminary of many discussions with Mr. Grundy, and that the final result may represent a full agreement between Mr. Grundy and our Committee as to a Mining Act for India. Mr. Grundy may be assured of our hearty support for any Mines Act for India, which has for its object the interests of the miners and the mining industry generally. At the short interview of last Friday, above referred to, we gathered that it is in contemplation to introduce a Mines Act which will compel a larger number of our Managers to have some kind of certificates of competency and other details connected with the working of mines which would not interfere with the development of the industry, but may be regarded as an advantage. We understood, however, that it was his intention to treat upon the Labour question very slightly, and on this point only to refer to the possible exclusion of children and infants from pits. We should be sorry to see any measure adopted in any way touching upon the Labour supply. No doubt Mr. Grundy having to face in his report an English House of Commons, who are almost entirely ignorant of the conditions attaching to the Indian Mining Labour, must feel himself at a considerable disadvantage, more especially after having gone through the Colliery districts. He must be convinced that

the conditions attaching to Labour in India are so entirely different to those obtaining at home.

We gather that he has committed himself to the Indian Government about the exclusion of children and infants, so, in support of our arguments that any interference of the slightest degree is unnecessary, we would refer him to the arguments put forward in the Memorial addressed to His Excellency the Viceroy, when the previous agitation took place a few years ago on the same subject, arguments which appealed so strongly to the Viceroy that he determined to let Mining Legislation alone. The same arguments have equal force to-day.

The percentage of children and infants, who may at any time be underground in pits is very nominal. They are taken down by the mothers who place them in some sheltered spot, either alone or being looked after by another, brother or sister, whilst the mothers do the lighter work obtaining for women. The question naturally arises, if the number be so nominal, why is special legislation on their behalf necessary. Were children and infants excluded from our pits, it would naturally lead to their mothers being excluded also, as in the pits, it is the custom for women to do the lighter work, such as filling the tubs with rubble and leaving their husbands, or the male workers, to do the heavier hewing work. It would naturally to that extent restrict the supply of Labour, and not only would it restrict the supply of female labour, but the men attached to these women would either claim higher wages to compensate for the loss occasioned by exclusion of women, or they would endeavour to find surface work so that they might have the opportunity of again working with their women folks. It will be seen how very seriously our Labour supply may thus be handicapped by a measure of this kind.

A short time ago an incident occurred in a pit of a trivial nature, not connected with fire damp or other dangerous element, and at once the entire Labour left the pits. It was only by the utmost coaxing on the part of the Manager, that they were prevailed upon to go down again, and we cannot too strongly reiterate our views that our Labour commands the position and not we, and therefore nothing should be done to hamper its supply.

I would also mention to show how very precarious our Labour supply is, that during the last twelve months, ending May, the output of the Collieries of the New Beerbhoom Coal Company for the twelve months, ending 30th of April 1893, was 232,560 tons, whilst the output for the following twelve months, ending 30th April 1894, was 191,250 tons, although we had all the necessary facilities for considerably exceeding the output of the previous year. In the year ending April 1893, there was an abundance of Labour supply, the harvest was moderate and therefore the Miners were very glad to go down the pits in order to earn their livelihood. In the following twelve months they had the advantage of an abundant harvest providing them with easy sustenance and therefore the incentive to work being gone, the supply of Labour was considerably shortened. In some pits it was reduced as much as fifty per cent. and in others even more.

It should also be borne in mind that the class or caste of men from whom our miners are supplied represents a very small community entirely consisting of the Sontals and Bouries. Were we to have available supply of Labour outside these castes and from the working population of India generally, any restriction would not greatly matter, as we would then be independent of any particular caste and we could choose our own conditions, but such is not the case, as has already been pointed out, and therefore we seek every opportunity for training the children, as soon as they possibly can, to do the lighter work of the pits and so form a valuable addition to our Mining Labour in later years, whilst the work done by them being supervised by their own parents is so trivial in nature that no hardship to them occurs.

We would, therefore, strongly suggest that inasmuch as the present system has worked well in the past, let us leave well alone and avoid any interference for a very doubtful gain, such as might be suggested from a children's clause in a Mining Act as applied to India. There is another aspect of the question, the cost of production. It is well-known that anything which interferes with Labour and so restricts its supply must inevitably lead to an increase in the cost of the coal produced. Can the industry bear the increased cost? The conditions attaching to the industry last year were quite exceptional. There was a strike of miners at home which raised the price of coal to an abnormal degree. The import of Cardiff was therefore much reduced, and what was imported could only be sold at a high cost. The Bombay consumers were therefore compelled to look elsewhere for possible sources of supply and turned their attention to Indian coal, taking a moderate quantity for experiments. The experiments were quite satisfactory and indicated that,

provided a fair difference was made in price, to compensate for the difference in the quality between Cardiff and Bengal coal, they could readily use Bengal coal. The position now is quite altered. English coal is coming down to its normal figure and with comparatively low rates of freight it is now competing favourably with Bengal coal. Any increase in the price of Bengal coal can therefore only tend to prejudice future development and so hamper in its growth this important industry which in its development will not only benefit itself but the manufactures of India generally. It is therefore to be hoped that Government, instead of bringing forward any restrictive legislation, will rather do all they possibly can to encourage the industry and do nothing to interfere with our labour supply.

It was unfortunate that at the Berlin Conference the English representative did not seem to be conversant with details of Mining Labour in India, as his was the only dissentient voice when it was proposed to lower the limit of age for children in Southern countries to 12, he evidently thinking that no exception should be made in Southern countries compared to those with a more temperate climate. We would therefore urge that the provisions of this Conference are by no means applicable to India, and trust our Government will see it in this light.

My remarks must by no means be regarded as being in opposition to any form of Mining Legislation. We will welcome any legislation which will tend to promote the prosperity of this industry, and as a means of arriving at harmony in connection with this proposed Legislation, I would suggest that a Conference should take place between Mr. Grundy and our Committee with three of the leading Managers in the Colliery districts and that the matter be fully discussed, so that the views of all may be heard. Moreover, as Mr. Grundy has arranged to remain in India for three years, we see no reason why the legislation should be so hastily carried out.

Dr. W. King, Director of the Geological Survey of India, said:

MR. CHAIRMAN and GENTLEMEN,—I happen to be in the proud position of being the oldest man among you and have had some experience of Mines and also of labour of all kinds. I know a good deal about the natives, but I think some of you will also remember that when I had to communicate with your firms, I said then, that I did not think that the time had come for Mining Legislation in India. All the information I wanted, I must say I received, and I really think that we could go on for some time longer without this Mining Legislation. But the English Government is strong, and will interfere with us, and it was evident that sooner or later we should have somebody sent out to arrange this Mining Legislation for us. There was a long correspondence between the Government of India and the Government at Home, and the Government of India, if I am not mistaken, showed itself averse to having legislation forced on it. They said that the time had not yet come for it, so that we have the Government of India on our side. The next thing was, that Mr. Grundy was sent out to us whether we liked it or not. Mr. Grundy has been placed in connection with the Geological Survey of India, through which I represent the Government of India, and he has to communicate with Government through me. I may say that Mr. Grundy has not committed himself with the Government of India. He is a stubborn type of Englishman and will not commit himself without having looked thoroughly into the subject. Mr. Gemmell remarked that too little time had been given for the expression of the Association's views. Well now, Mr. Grundy has been working hard in inspecting mines during the last few months and he has not had time to give you any of his views. I may say, he has not given them to me, although I have tried hard to get them out of him. However, when the Report is ready, I shall have an opportunity of reading it over, for I have to make my supplementary remarks to the Government on the matter. At the same time there is no doubt, you will have Mining Legislation of some kind or another, but between myself and Mr. Grundy and your Association we will endeavour to work out something which will not be against your interests, and put it as strongly as possible before the English Government.

Babu Ram Chunder Banerji, Baraboni Coal Co., Ld., said:

I have found on visits to the collieries, that many of the men are in the habit of spending their earnings at the grog-shop, which the women do not, and therefore it is important that the latter should not be deprived of the power of wage earning. Another important point is, that men and women, alike, are so accustomed to labour all their lives, that if they ceased to do so they get ill and die.

The Chairman then proposed, and Mr. Allan Arthur seconded, the following resolution which was carried unanimously :—

**That while this Meeting will not oppose any well-considered and competently devised rules and regulations calculated to improve the safety of the mines, it desires to express very emphatically its disapproval of any attempt to interfere with the labour which works in or about such mines.**

Mr. A. Simson proposed, and Mr. George Lyell seconded, the following resolution which was carried unanimously :—

**That the proceedings of this Meeting, and copies of Resolutions passed thereby be sent to the Bengal Chamber of Commerce, soliciting their support, and asking them to endeavour to obtain from Government an assurance that legislation will not be introduced before Coal owners have had an opportunity of seeing the Report of the Inspector of Mines, and expressing their views thereon.**

Mr. W. J. M. McCaw proposed, and Mr. E. Cable seconded, the following resolution which was carried unanimously :—

**That a full copy of the Proceedings of this Meeting be forwarded by the Secretary to Mr. Grundy for such action as he may consider advisable.**

The proceedings closed with a cordial vote of thanks to the Chair, proposed by Mr. A. Simson.

W. GRAY,
*Chairman.*

## 47. Female employment in Mines.

Why females go out to work.

The principal reasons for females going out to work is to earn money. In the case of a *mother*, it is to help to support the family, the present wages of an Indian miner not being apparently sufficient for this. Men often marry principally because the wife can work, and earn more than will keep herself. I have met with cases where the wife had a very bad time indeed after she was unable to continue working; and also where this had led to the husband divorcing his wife. It is thus better for many married women to work if they can. The lower class of men even marry a second wife because each can earn something towards his own support. *Widows* go out to work to support themselves and their family, and often one or more aged relatives. There appears to be no provision in the country for the widows, orphans, sick, or aged, except the charity of their own relatives and friends.

No provision, but work, for the needy.

Little household work for females.

The household work of an ordinary miner's establishment is very small indeed; therefore, unless there are children to be cared for, there is nothing for the wife to do, who stops at home. The house itself is very small, and there is little or nothing about it requiring to be daily cleaned. I have seen the inside of a great number of them, and there is no furniture to clean; no crockery to wash and keep clean; little or no bedding or bed clothes; no sewing, for all their clothes are in one piece and are neither stitched, tied, nor have buttons; hooks and eyes, nor pins; and the sum total of the cooking utensils is made up of two or three vessels.

Why females take to underground mining work.

Females of all ages and conditions take to under-ground mining work, because there is not sufficient other work available for them, and none that pays them as well; it is also the place where their friends and nearest relatives work, and husbands and parents like to have their wives and children near them.

Clothing dress.

As to clothing, both males and females go to, and work in the mines with just the same amount and kind of dress as they wear at home and at other times. And the females are just as proud at one time as another, and do all kinds of work under all sorts of circumstances, without changing the style or amount of their dress, or the quantity of ornaments they wear.

Ornaments.

The female coal and coal-dust carriers do their work with all their ornaments and paraphernalia as worn at other times: rings through their ears and nose, on their fingers and on their toes, armlets sufficient in number and size to nearly cover one or both arms, and anklets that appear to be a great hindrance to their walking, and produce a jingling sound by their continual knocking together. This taste for ornaments is so strong, that many of the mining females have ornaments of elegant design tattooed nearly all over both arms, in the belief that they will even wear these ornaments after death.

The same ference between king and other as as prevails in gland.

There is, therefore, much less difference in the dress than is prevalent in England, where all the mining people, whether employed above or below-ground wear very much poorer clothing at work than at other times; and where the dress of underground workers, when actually at work, is very small indeed as compared with that worn by the same persons on the surface. The dress of an Indian male miner, as well as of nearly all other males in mining districts, is very scanty at all times, and neither males nor females of any age ever wear shoes or stockings either in the mine or out of it, and seldom a head covering.

Persons with whom females work.

Some females are engaged directly by the officials in charge, these work in pairs as water-bailers; and in gangs or parties of females as dust cleaners, and as trammers. The Sonthal women are somewhat peculiar and will not even work together in a gang of females, without having a man in charge. The males too, of this caste, are very suspicious of the behaviour and actions of the females of their own caste; but perhaps this is more noticeable because they are distinguished as only marrying when well grown up to maturity. The other females are not engaged directly by the owners. When a man engages to work as a coal-cutter it is understood that he may bring to work with him any one he pleases, and of course he naturally takes those who will be of most benefit to himself, namely, his children and wife, and relatives or friends. As may be expected in a country of multitudinous castes they are very peculiar as to whom they will work with, or in fact join in to do anything. One example will illustrate the force of this to an Englishman. A servant in an establishment tried to raise a long ladder so as to get up to one of the windows, he was unable to do this, and an official ordered another servant of about equal standing but of another caste to assist him, this man absolutely refused, saying that he could not possibly touch the ladder at the same time that the other man was touching it, but that if he would leave the ladder, then he would himself put it into the desired position; the first man left the ladder and the second then put it into position. Again, one of my servants earning a few rupees a month would break his caste by carrying for me or handling for me food or even a glass of water, and consequently refuses to do this. This same man cooks and eats his food quite alone, and he would destroy any food or any of his vessels used for drink or food that I should happen to touch. This is only one of the many peculiar phases of this most peculiar people, and shows how curious the people are and how the caste systems and prejudices of even the poorest among them has at all times to be recognized; and how much it is necessary to know all their peculiar characteristics for the purpose of directing them and controlling them with peace and success. These peculiarities and marked differences in the castes influences to a very great degree the morality of the people; it being a great breach of the social and caste conditions of any village for any person to make friends with one of another caste.

ste prejudices ngst workers.

ense of caste, morals.

Moral danger of leaving females at home.

Many miners profess to being afraid of leaving their females at home, because there is there much greater opportunities for the lustful men of their own caste carrying out their designs; and that at home during the absence of most of the family the facilities for this vary in so many and varied ways, even with the position of the village, its shape, and the relative positions of the doors.

Tall seams, no stooping.

Nearly all the seams are tall enough to make any stooping or creeping quite unnecessary.

Work done by females.

The work mostly done by females in Indian mines is carrying coal, and coal-dust, either in "tokeris" baskets, or lumps on their head. This is a kind of work that they can do to perfection, both in the balancing, and the weight and distance carried. Carrying on the head has the appearance of being a natural inheritance to all the females in mining districts. I one day saw a fine girl, who appeared to be about 15 years of age, trying to handle a lump of coal that had been brought to the bottom of a very steep incline, she was quite unable to lift it, but the combined strengths of a man and herself got the coal on her head; then she ran up the incline with it almost as if she had nothing to carry, and ran down again and again for more. All appear to be at their ease whether carrying the "ghara" full of water, a full basket, or anything else on their head.

Females born carriers of head loads.

It is natural to them, they appear to be born to carry loads on their heads, and it is not in any sense like the unnatural work of the female workers under-ground in England before the prohibiting Act was passed.

Work in England and in India compared.

And speaking from a long personal mining experience in England, extending over 33 years, and the inspection of 67 mines in Bengal, I am able to say, that the work of women and children in Indian mines bears no comparison whatever to that of the women and children in England prior to the passing of the prohibiting Act; nor does the work of children and grown males bear comparison with the amount of work done by similar persons in England at the present time; and less so to the English miner's work so recently as about 1865. Then, the work there was hard and continuous, and the day's labour was about twice the length of that of an Indian miner's day's work. On the other hand, the Indian miner does not eat such food as will provide him with great strength; his work is often hard, but he generally works quietly, often leisurely, resting whenever it pleases him to do so, and even has an occasional sleep or a play on his flute, and the time he is in the mine is comparatively short. This applies equally to both sexes and all ages. But I have a vivid recollection of boys in Lancashire, about the time referred to above, working up to 13 hours even on Saturday for one day's wages; and in winter never seeing the sunshine or daylight, except on Sundays: there is nothing to equal this in India.

## 48. Prohibition of females, and the Berlin Conference.

No wish or expressions of opinion in India in favour of female prohibition.

There does not appear to be any wish in India for the prohibition of females from working in mines; nor have I received or heard of any complaints in this respect; nor met with any expression of opinion, or received any answers to my questions that favoured such prohibition. On the contrary, the numerous opinions that have been expressed to me by both males and females in many stations of life, and those so frequently seen in the Indian press, give the appearance of there being an universal opinion in India in favour of allowing females to go on working in the mines as they do now.

All such expressions come from England.

The expressions in favour of prohibition come from England, where everything connected with the people is as different as it can possibly be; and where the child and female labour in mines, before the Act of the 10th August 1842, prohibiting it, was, as compared with the work in Indian mines, base and cruel in the highest degree.

Resolutions of the Berlin Conference of 1890.

I have been referred to the resolutions of the Berlin Conference of 1890 with reference to child and female labour. I sincerely hope and trust that the high, noble, and humane principles of that Conference will ever be borne in mind in India and energetically practised; but to carry out the resolutions literally, according to the exact words, is another thing altogether, or in the words of the Conference itself, it is "necessary to take into consideration the differences between the political, social, and industrial situation of each country." And that "consideration must be had to the exigencies of industry, and to the financial position of the working families of which it is the principal support; and care taken only to advance with prudence on grounds where such considerable interests are at play."

"To break down or seriously cripple an industry is not a means of protecting or benefitting the working classes."

The prohibitive resolutions of the Conference not applicable to India at the present time.

The prohibitive resolutions of the Conference as they stand do not appear to be applicable to Indian mining people at the present time; but some protective measures are required.

Was India represented or included at the Berlin Conference.

With a view to dealing with most things connected with this intricate subject, I may say that it has been suggested that as India took no part in the Berlin Conference it was not included amongst the nations agreeing to the resolutions, or binding themselves to carry them out. The arguments for and against this view appear to be as follows:—

1. That the Resolutions of the Berlin Conference do apply to India equally with other nations.—The only reference to India was the single fact that Sir John E. Gorst, one of the British plenipotentiaries at the Conference, was at the time Under-Secretary of State for India.

2. That India was not included at the conference.—

(*a*) Lord Cross, the then Secretary of State for India, in a despatch to the Governor General of India in Council, No. 59, dated 3rd July 1890, made the following remark:—"It may not be necessary for India, who was not directly a party to the Conference, to circulate her factory reports to other nations."

(*b*) If India was represented at the Conference, it was, apparently, not by any one who knew India well. The proof of this being the fact that the proposal to fix the inferior age limit at 12 years instead of 14 years, for southern countries, was opposed by Great Britain alone, by a country ruling India where the young come to maturity, marry, and girls become mothers as early as 12 years of age; and the people are thought to have lived to a very fair age if they live up to 40 years of age.

## Details of:—

### 49. LABOUR IN MINES.

| *Advantages to females working in mines.* | LABOUR IN MINES. *Disadvantages to females working in mines.* |
|---|---|
| 1. It provides them with labour, and saves them from distress, enables them to get better food and clothing, and other things to make them happy. Puts them into better means for providing for the marriage of their children, a matter to them of the first moment, and one that is very expensive when they wish to keep up their social dignity as most of them do. So far as I have been able to ascertain, there is not sufficient other work for females in mining districts. | 1. They come into daily contact with far more men than they would at home, or at some employments on the surface; though not more than at many employments above-ground. Coming into frequent contact with men of the lowest class does undoubtedly give a tendency to masculine roughness. But there is seldom female work at mines that equals in this respect, or in danger, the carrying of bricks and mortar up the crudest and most primitive of ladders, to the top of tall buildings and chimneys, work that scores of females may be seen doing every day both in Calcutta and elsewhere. |
| 2. If they did not work in mines many would have nothing else to do, and would not be so healthy or so happy as they are. | 2. They have often to work in confined places, in thick smoke, and bad smells. This can be, and should be remedied, though most of them are probably accustomed to bad smells. |
| 3. They get more wages by working below-ground than at most other work. | 3. Often have to work most of the day in places that are wet and cold under foot, and often with water pouring over them from over head. Most of this can be remedied. |
| 4. They work less time each day, apparently two hours a day less than females who work at mines above-ground. "The working day" being about 4 hours less, and they probably do less work than those above-ground in the same time. | 4. Have to work in partial darkness, with artificial and smoky lights. But I found many working without lights at all, of their own choice, for the purpose of saving the oil to burn at home or to sell. |
| 5. With the exception of those who carry coal to the surface, they are not exposed to the sun's heat during the hottest part of the day. At most mines it is quite cool below-ground, when the sun's heat above is almost unbearable. | 5. They are exposed to more bodily dangers than at the ordinary work on surface. |
| 6. When working in the mine, the females are enjoying the company and protection of husbands and relatives most of the day. This along with the wages they earn are strong inducements for both males and females taking to mining work. | 6. The *wife* is not able to make the home as comfortable for the husband as she would be able to do if she stayed at home, by having the small house tidy, the water and fire prepared, and his food cooked for him on returning from work. Instead of that, the husband and wife leave work, both dirty, without water and without fire at home for cooking the food, rice and dál, that requires nearly an hour to cook. But all the necessary work in a native miner's home would only occupy a woman for a small fraction of a day. |
| 7. The work is in close accordance with their ordinary social habits and customs; they do the work quite naturally, and although it is often hard work they do it with apparent ease. | 7. The *mother* cannot take the same care of the children as if she stayed at home with them, and the children to some extent suffer from neglect, though not to a great extent. |

LABOUR IN MINES—*contd.*

*Advantages to females working in mines.*

8. Children of both sexes learn mining when young, and this is very apparent, for they, and men and women, may be often seen, of all ages, in positions and doing work that the majority of Englishmen would be quite afraid, and even could not do; for instance, the natives will readily and cheerfully work on the smallest and most crude scaffolding and ladders at a great height; and also close to the edge of pits, with the appearance of being absolutely beyond fear. Indeed it is often troublesome to keep very small children and grown up persons from playing and sitting quite close to the tops of pits, even on the pit walling.

LABOUR IN MINES—*contd.*

*Disadvantages to females working mines.*

## Work, workers, wages and times of work at the Mines inspected.

Particulars as to 20 "European" mines and 3 Native mines where the printed report form was filled up. These are the most important mines or collieries in Bengal :—

| Description. | Below-ground. | | | Above-ground. | | | Below-ground and above-ground. Total Number. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | European mines. Number. | Native mines. Number. | Total Number. | European mines. Number. | Native mines. Number. | Total. | | |
| Men | 9,115 | 210 | 9,325 | 3,926 | 68 | 3,994 | 13,319 | |
| Boys 10 to 16 years | 1,043 | 2 | 1,045 | 758 | 2 | 760 | 1,805 | |
| „ under 10 „ | 144 | 2 | 146 | 162 | Nil. | 162 | 308 | Not many under 10 years. |
| Women above 16 „ | 2,816 | 27 | 2,843 | 1,110 | 121 | 1,231 | 4,074 | |
| „ 12 to 16 „ | 698 | 3 | 701 | 751 | 4 | 755 | 1,456 | |
| Girls under 12 „ | 173 | 2 | 175 | 223 | Nil. | 223 | 398 | Not many under 12 years. |
| „ „ 10 „ | Nil. | Nil. | Nil. | Nil. | Nil. | Nil. | Nil. | No girls given as under 10 years, but there were probably a few. |
| Total | 13,989 | 246 | 14,235 | 6,930 | 195 | 7,125 | 21,360 | |
| Married females | 3,350 | 26 | 3,376 | 1,976 | 95 | 2,071 | 5,447 | Only about 8 per cent. unmarried. |
| Unmarried females | 337 | 6 | 343 | 108 | 30 | 138 | 481 | |

*Summary of the above table as to females and children.*

At the above mines females employed below-ground formed 26·1 per cent of the total number of persons employed below-ground; and females employed above-ground formed 31·0 per cent of those employed above-ground.

Girls under 12 years employed below-ground formed 4·7 per cent of the total number of females employed below-ground; and 1·2 per cent of the total number of persons employed below-ground.

Girls under 12 years employed above-ground formed 10·0 per cent of the total number of females employed above-ground; and 3·1 per cent of the total number of persons employed above-ground.

Boys under 10 years employed below-ground formed 1·3 per cent of the total number of males employed below-ground; and 1·0 per cent of the total number of persons employed below-ground.

Boys under 10 years employed above-ground formed 3·2 per cent of the total number of males employed above-ground; and 2·2 per cent. of the total number of persons employed above-ground.

*Particulars as to age of oldest women employed at 20 European and 3 Native Mines.*

| Oldest women below-ground. | Oldest women above-ground. | Remarks. |
|---|---|---|
| 1 mine gave 30 years. | 1 mine gave 20 years. | Average age of women below-ground is about 42 years. |
| 4 „ „ 35 „ | 1 „ „ 30 „ | |
| 8 „ „ 40 „ | 1 „ „ 35 „ | And the average age of the women above-ground is also about 42 years. |
| 4 „ „ 45 „ | 6 „ „ 40 „ | |
| 5 „ „ 50 „ | 5 „ „ 45 „ | |
| 1 „ „ 55 „ | 4 „ „ 50 „ | |
| | 2 „ „ 55 „ | |
| | 3 „ „ 60 „ | |

*As to females and children employed below-ground.*

The foregoing shows that at 23 of the most important mines in Bengal, employing 21,360 persons, 14,235 of whom work below-ground, there are 3,719 females, forming 26·1 per cent of the under-ground workers.

Of all the females working below-ground at these mines, there are only 175 or 4·7 per cent of them below 12 years of age, forming 1·2 per cent of the under-ground workers, or an average of 7·6 at each colliery.

Of all the males working below-ground at these mines, there are only 146 or 1·3 per cent of them below 10 years of age, forming about 1 per cent of the under-ground workers, or an average of 6·3 at each colliery.

The next table shows that at the 62 collieries visited there are 5,494 females employed below-ground, forming 28·5 per cent of under-ground workers.

Also, that only 8 of these collieries, or about 13 per cent, employ boys below-ground under 10 years of age.

And that 25 of the collieries, or 40 per cent, employ girls under 12 years of age.

Twelve years is the marriageable age for females; and it is probable that a very large majority of the females over 12 years of age are married; the bulk of the exceptions being among Sonthals, and perhaps one or two other small groups.

Particulars of under-ground workers at 62 of the collieries visited:—

| | Number. | |
|---|---|---|
| Males | 13,751 | |
| Females | 5,494 or 28·5 per cent of the total persons employed under-ground at these mines. | |
| Total | 19,245 | |
| **Youngest boys.**—1 Colliery, or 1·6 per cent of the collieries gave youngest age as 7 years. | | |
| 3 „ 4·8 „ „ „ „ 8 „ | | Only about 13 per cent gave under 10 years of age. About 53 per cent gave youngest age as under 12 years. |
| 4 „ 6·4 „ „ „ „ 9 „ | | |
| 24 „ 38·7 „ „ „ „ 10 „ | | |
| 1 „ 1·6 „ „ „ „ 11 „ | | |
| 15 „ 24·2 „ „ „ „ 12 „ | | |
| 2 „ 3·2 „ „ „ „ 13 „ | | |
| 4 „ 6·4 „ „ „ „ 14 „ | | |
| 3 „ 4·8 „ „ „ „ 15 „ | | |
| 4 „ 6·4 „ „ „ „ 16 „ | | |
| 1 „ 1·6 „ „ „ „ 30 „ | | |
| **Youngest girls.**—1 Colliery, or 1·6 per cent of the collieries gave youngest age as 7 years. | | |
| 4 „ 6·4 „ „ „ „ 8 „ | | About 9½ per cent gave youngest age as under 10 years; and 40 per cent as under 12 years. |
| 1 „ 1·6 „ „ „ „ 9 „ | | |
| 19 „ 30·6 „ „ „ „ 10 „ | | |
| 15 „ 24·2 „ „ „ „ 12 „ | | |
| 6 „ 9·6 „ „ „ „ 13 „ | | |
| 5 „ 8·06 „ „ „ „ 14 „ | | |
| 5 „ 8·06 „ „ „ „ 15 „ | | |
| 5 „ 8·06 „ „ „ „ 16 „ | | |
| 1 „ 1·6 „ „ „ „ 25 „ | | |

A great number of the under-ground workers do some work also on the surface, especially where coal is brought out of the mine along inclines.

## Particulars of times and hours of work.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Mines | employing | 1,342 | persons | under-ground | begin work at | 7 | a.m. | | |
| 1 | ,, | ,, | 303 | ,, | ,, | ,, | 7-30 | ,, | | |
| 10 | ,, | ,, | 2,289 | ,, | ,, | ,, | 8 | ,, | | |
| 21 | ,, | ,, | 6,440 | ,, | ,, | ,, | 9 | ,, | | |
| 1 | ,, | ,, | 72 | ,, | ,, | ,, | 9-30 | ,, | | |
| 18 | ,, | ,, | 3,162 | ,, | ,, | ,, | 10 | ,, | | |
| 1 | ,, | ,, | 86 | ,, | ,, | ,, | 11 | ,, | | |
| 1 | ,, | ,, | 56 | ,, | ,, | ,, | 12 | noon. | | |
| 5 | ,, | ,, | 533 | ,, | ,, | leave off work at | 4 | p.m. | | |
| 1 | ,, | ,, | 1,198 | ,, | ,, | ,, | 4-30 | ,, | | |
| 12 | ,, | ,, | 5,063 | ,, | ,, | ,, | 5 | ,, | | |
| 22 | ,, | ,, | 5,024 | ,, | ,, | ,, | 6 | ,, | | |
| 5 | ,, | ,, | 448 | ,, | ,, | ,, | 7 | ,, | | |
| 1 | ,, | ,, | 23 | ,, | ,, | ,, | 7-30 | ,, | | |
| 5 | ,, | ,, | 407 | ,, | ,, | ,, | 8 | ,, | | |
| 2 | ,, | ,, | 610 | ,, | ,, | ,, | 9 | ,, | | |
| 1 | ,, | ,, | 144 | ,, | ,, | ,, | 10 | ,, | | |
| 1 | ,, | ,, | 300 | ,, | ,, | ,, | 11 | ,, | | |
| 1 | ,, | ,, | 1,198 | ,, | ,, | work a night shift from | 7 p.m. | to 6 a.m. | | |
| 3 | ,, | ,, | 1,781 | ,, | ,, | ,, | ,, | ,, | 9 ,, | to 5 ,, |
| 1 | ,, | ,, | 415 | ,, | ,, | ,, | ,, | ,, | 9 ,, | to 6 ,, |
| 3 | ,, | ,, | 760 | ,, | ,, | ,, | ,, | ,, | 9 ,, | to 7 ,, |
| 1 | ,, | ,, | 503 | ,, | ,, | ,, | ,, | ,, | 10 ,, | to 5 ,, |

The number of hours of work, and the time of beginning and ending work is very irregular, so that the above particulars are only approximately correct.

At quite a number of the mines persons come long distances to their work, these come and work in gangs a long or double shift at a time. That is, they work, with periods of rest, for 24 hours, and then leave the mine for 24 hours.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Mines | employing | 493 | persons | under-ground | gave | 5 | hours as the time actually worked in one shift. | | |
| 13 | ,, | ,, | 2,318 | ,, | ,, | ,, | 6 | ,, | ,, | ,, |
| 13 | ,, | ,, | 1,562 | ,, | ,, | ,, | 7 | ,, | ,, | ,, |
| 19 | ,, | ,, | 8,519 | ,, | ,, | ,, | 8 | ,, | ,, | ,, |
| 2 | ,, | ,, | 381 | ,, | ,, | ,, | 9 | ,, | ,, | ,, |
| 3 | ,, | ,, | 371 | ,, | ,, | ,, | 10 | ,, | ,, | ,, |
| 1 | ,, | ,, | 56 | ,, | ,, | ,, | 13 | ,, (probably more than one shift.) | | |
| 1 | ,, | ,, | 144 | ,, | ,, | ,, | 18 | ,, (for double shift.) | | |
| 3 | ,, | ,, | 493 | ,, | ,, | ,, | 30 | ,, work done per week. | | |
| 13 | ,, | ,, | 2,318 | ,, | ,, | ,, | 36 | ,, | ,, | ,, |
| 11 | ,, | ,, | 1,370 | ,, | ,, | ,, | 42 | ,, | ,, | ,, |
| 2 | ,, | ,, | 723 | ,, | ,, | ,, | 44 | ,, | ,, | ,, |
| 7 | ,, | ,, | 7,796 | ,, | ,, | ,, | 48 | ,, | ,, | ,, |
| 2 | ,, | ,, | 192 | ,, | ,, | ,, | 49 | ,, | ,, | ,, |
| 3 | ,, | ,, | 525 | ,, | ,, | ,, | 54 | ,, | ,, | ,, |
| 2 | ,, | ,, | 227 | ,, | ,, | ,, | 60 | ,, | ,, | ,, |
| 2 | ,, | ,, | 56 | ,, | ,, | ,, | 78 | ,, | ,, | ,, |
| 46 | ,, | ,, | 3,613 | ,, | ,, | ,, | 6 days per week. | | | |
| 9 | ,, | ,, | 1,000 | ,, | ,, | ,, | 7 | ,, | ,, | ,, |

It appears that males work below-ground 6, 7, 8, and up to 10 hours, giving an average of 8 hours per day.

Males work above-ground 6, 8, 8½, 9, 9½, and up to 10 hours, giving an average of 8½ hours per day.

Females work below-ground 5, 6, 7, and up to 8 hours, giving an average of 6½ hours per day.

Females work above-ground 6, 7, 8, 8½, 9, 9½, and up to 10 hours, giving an average of 8¼ hours per day.

These hours for work above-ground are *exclusive* of the intervals for meals.

It thus appears that females work about 2 hours a day less below-ground than on the surface; but when the intervals are added, the "working day" above-ground is about 4 hours longer than below-ground.

Times of beginning and ending work.

The times of beginning and ending work is somewhat striking in its irregularity and apparent absence of system. They begin at all hours from 7 A. M. to 12 noon; and some "dust carriers," females, begin work before 7 A. M.

The day's work finishes at all times between 4 P. M. and 11 P. M.

What regulates the time of beginning work.

A few collieries have fairly definite and regular times for beginning and ending work; but Managers at other collieries say that this is impossible to carry out, because all their workmen and workwomen will come to work just at such times on any day as pleases themselves. The people appear to regulate the time of going to work by the season, and by their own personal habits. Some carry their morning meal of rice to the mine, and these generally get there earlier than the majority. Most work persons eat their morning meal at home, then have the necessary rest, also a smoke, a talk, and often a song and instrumental music; and in winter time they will not go into the mine until the sun is out, and has been out long enough for them to become thoroughly warmed. They depend almost entirely on the sun for heat and for time, and miss no opportunity in the cold season of exposing the bare body to the sun's heat,—a process that makes them feel comfortable and happy. The three principal times of a day with them appears to be sunrise, noon, and sunset; and they can guess the time of day at these periods very accurately. I believe clocks and watches are possessions quite unknown to native workmen; they go by the time of the big clock—and accurate time-keeper—the sun, that never requires to be wound up, and never runs down; that gives the light to see by, warms them, brings about the pleasant showers, and gives them good crops of rice, their staple food. No wonder then, from a poor native's point of view, that they worship the sun as the giver of so many good things; or that they are loath to leave such a good friend by going into the darkness of the mine, and therefore go to work at times that are about as irregular as they can well be.

Hours worked. Per day.

The very variable number of hours worked per day and per week is worth notice. The hours worked, that is, the hours they are supposed to be working in the mine each day, varies from 5 to 10, and even up to 13 and 18 hours;

Per week.

and the hours per week varies from 30 to 60, and even up to 78 hours.

It is the universal practice to separate the hewn coal below ground, in the working place, into "dust" and coal; and in many mines females work more or less in the night time to clear away the dust from the working places

Night shifts.

ready for the coal getters beginning work in the day shift. In addition to these night-workers, there are 9 mines or collieries, employing a total of 4,657 persons belowground, that have regular night shifts of work.

Days per week.

Some pits work every day in the week, some only six days per week. Some

Sundays.

"European collieries" in Bengal are supposed to observe Sundays as holi-

Holidays.

days; and all mines are obliged to observe, at least as a partial holiday, the many púja and native festivals that are constantly occurring throughout the year; so that the average does not come to anything like six working days per week. Of course this does not apply to officials. A mine requires constant attention, and the number of days' work per week of the officials may be said to be every day.

Prices, and wages.

The prices paid for coal-cutting are more uniform than most things, and come to about annas 8 per ton of coal. At a few mines the price varies with the distance the coal has to be carried; and this appears to be a principle well worth extending. The amount earned per day is generally described as "Good;" the amounts are shown by the following particulars, which also show that under-ground work of all kinds claims higher wages than surface work. This is one of the principal reasons why females wish to work under-ground.

*Wages, and Work.*

Buckets hold 6 to 8 maunds of coal or coal dust.

Tubs hold 10 maunds of coal or coal dust.

The prices paid are—

| | R | a. | p. | | |
|---|---|---|---|---|---|
| Buckets of 7 maunds . . . . | 0 | 2 | 0 | per bucket | about the same |
| Tubs of 10 maunds . . . . | 0 | 3 | 0 | „ tub | rate, |

or per ton of coal about 8 annas. But goes up to 9 annas per bucket when the carrying distance is long.

*Belowground.*

Wages of coal-cutters and of men who get fixed rates per day—

| | R | a. | p. | | R | a. | p. | |
|---|---|---|---|---|---|---|---|---|
| Coal-cutters, sirdars, stone-men, propping and rail men get from . . . . . | 0 | 3 | 0 | to | 0 | 8 | 0 | per day. |

*Aboveground.*

Skilled labour and others—

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Mechanics, enginemen, screeners, firemen, masons, and labourers get from . . . | 0 | 2 | 6 | to | 1 | 5 | 0 | per day. |

*Wages of women belowground.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Coal-carriers and putters . . . . | 0 | 2 | 0 | to | 0 | 4 | 0 | per day. |

*Wages of women aboveground.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Screeners, loaders, and masons' labourers, and water-bailers . . . . . | 0 | 1 | 6 | to | 0 | 2 | 0 | per day. |

*Wages of children belowground.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Trammers, coal-carriers and putters, and water-bailers get from . . . . . | 0 | 2 | 0 | to | 0 | 4 | 0 | per day. |

*Wages of children aboveground.*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Screeners, loaders, and masons' labourers . . | 0 | 1 | 6 | to | 0 | 2 | 0 | per day. |

It will be seen from the above that the wages of women and children are much more belowground than aboveground, forming a great inducement for all who can to work belowground. Thus a child of 12 years of age, or under, gets from 2 annas to 4 annas belowground; while a woman above 12 years of age only gets from 1½ anna to 2 annas for working aboveground; and in addition has to work a greater number of hours per day than those belowground.

Wages are paid at most mines daily; the people go to the office and receive their wages at the close of each day's work.

At a few mines the payments are weekly.

The "hazri" labourers, who get fixed day's wages, are paid at various times—weekly, fortnightly, and monthly.

There does not appear to be any deductions or anything to pay back out of the miner's wages, except for sick and accident funds, and on account of money borrowed. The Indian miner appears to be a great hand at getting advances of money and running into debt. I did not find that Managers charged the work persons any interest on the borrowed money.

The owners provide their work persons with allowances of—house to live in, coal, land for growing rice, tools, and oil to burn in their pit lamps.

At most mines the work persons get some "bakshish," or money allowances. This is given in various ways, for many reasons, and under various names; one colliery gives it the respectable name of "a monthly commission."

The wages earned per bucket or tub does not represent the sum total of a miner's earnings, as is shown above.

All the coal at all the collieries is paid for by measure. At one colliery the coal was being weighed, but principally to find out whether the load came up to the required weight, no notice being taken of the amount it weighed above that. The miner is a great cheat in the way he manages to place the lumps in the tub or bucket so as to leave it hollow in the middle. But, although I do not think it would be opportune to enforce a system of weighing as in England, I do think that the tubs, trams, or buckets, for which fixed rates are paid, should be of a fixed, known, and recognised capacity. As it is, at many mines the trams and buckets are supposed to hold a certain weight when properly filled, for which a fixed price is paid, when in reality, if they be properly filled, they hold a great deal more than the recognised weight. This leads to dishonesty all round.

The following short summary shows that there are no recognised intervals for meals for underground workers. The intervals for meals aboveground are for the time of day when the sun is hottest, and are required even though it should not be a time when meals are taken. The beginning of the interval and its duration is regulated by the power and effect of the sun.

More could, perhaps, well be done in providing places for surface work-persons to take shelter from the sun's heat. It is not at all uncommon to see them of both sexes, and all ages, sitting and lying under railway wagons for protection, as well as in other peculiar places.

It must not be understood that underground workers have no interval, or that the interval about noon is the only one the surface work persons have; each one appears to reserve to himself or herself the absolute freedom and power of taking a rest either standing, sitting, or lying, whenever and wherever he or she feels disposed to do so. And I have often seen them; of both sexes, aboveground and in the mines sitting and lying on the floor and in their baskets or "tokeris," many quite fast asleep; others again, chatting, singing, smoking, and playing the flute, with the appearance of never being in a hurry, and without any concern for the time that is rolling along never to return.

**A short Summary.**

| Total number of inspections— | | Remarks. |
|---|---|---|
| Underground | 103 | A large number of surface inspections and enquiries were made in addition to these. |
| Number of separate mines | 67 | |
| European mines | 32 | |
| Native mines | 35 | |

Some particulars of intervals, work, and wages at mines inspected.

*Interval for meals underground.*—None recognised.

*Intervals for meals and rest, aboveground.*—During summer generally from 1½ to 2½ hours; and nearly in all cases between 12 noon and 2-30 P.M., though at some mines the intervals begin at 11 A.M. and 11-30 A.M.; this is determined by the intensity of the sun's heat.

During winter probably an hour less than in summer.

*Interval between shifts.*—None recognised. Persons of both sexes and all ages are, at the close of one shift, allowed to return to work as soon as they will.

*Kind of work—*

Men belowground—Coal-cutters, carriers, sirdars, stone-men, propping and rail men, etc. On surface—mechanics, enginemen, screeners, firemen, masons and labourers, etc.

Women belowground—Coal and dust carriers, trammers, water-bailers, and furnace stokers.

Children belowground—Coal-carriers, trammers, and water-bailers, etc.
Women aboveground—Coal-carriers, screeners, and sundry work.
Children Ditto ditto ditto.

* *Wages*—

Men paid so much per bucket or tub, and also by footage; and earn from 3 annas to 8 annas per day; also by daily wages.
Women coal-carriers are paid through their husbands, and others direct, from 2 annas to 4 annas per day.
Children paid from 2 annas to 4 annas per day.

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## 50. Evidence as to prohibition of females from working in mines.

22nd January 1894.

*East Indian Railway Company's Colliery, Giridih.*

*Women and Children.*

taken *in*

Evidence taken *in* No. 25 pit.
Name—Lakia Kahain.
Age—About 30.

Says she is a coal carrier for her husband; has five children; lives in Serampore village. Mother-in-law takes care of the children while she is at work. They are paid by the number of tubs of coal filled, and earn between them R1-8 per week. The wages of her husband would not keep the family; and *she wants to know how her family would be kept if she was not allowed to work in the mine.* She has worked in the mine from being about 13 years of age. Her thumb was cut last year, and that kept her off work for two weeks, and that was the only injury she had ever received in the mine.

The husband, Harir Kahar, borrowed R12 about ten or twelve years ago on condition that until R16 were paid in a lump sum they are to work for the Brahmin at any time that he requires them, the only pay or consideration for that work is that they each get about 1 seer or 2 lbs. of *dhan* (unhusked rice) for food; or about the same weight of other grain.

Thinks that females should be allowed to work in mines.

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Giridih, 23rd January 1894.

Evidence of Kabilasi Doosadin, widow for one year, about 25 years of age. Have two boys of 10 and 3 years respectively. Live at Kurhurbari Colliery, Chaitadhih village in Giridih. My husband was a coal cutter, and I worked in the mine with him, and have worked in from being a small girl; I still work in the mine as a dust filler, and have to support myself, two children, and my husband's mother. I cannot get work on the surface. I earn annas two for each day's work, and I work with another woman who earns the same. A woman could only earn six pice or one-half anna per day on the surface. I prefer to work in the mine rather than on the surface. If my work in the mine was taken from me, I should have no means of supporting my family except to beg for them. I do not intend to get married again, but I wish to work in the mine for the support of my own family. I went to my husband's house as a child and grew up and worked with him in the mine: and it depends more on the people themselves than on the place they work in whether they are as good morally in one place as another.

---

Giridih, 24th January 1894.

Punia, Dhobin; about 32 to 35 years, I am married but my husband has

gone away from me. I have one child, a married daughter about 16(?) years of age. Am a dust filler at No. 25 pit, Serampore Colliery; and have worked in mines for about 17 years, and never been injured, and never seen any one injured there. I cannot say anything wrong about females working in mines. I saved sufficient to buy 2 cows, 4 bullocks, and 4 goats, about R65 worth, and have also paid the marriage expenses of my daughter, about R20. I do not know of any reason why females should not work in mines; but the object is to get money and they can get more by working in mines than on surface.

Work.

Object for working in mines.

Caste. I am of the Dhoban, or washerwoman caste (a low caste).

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Female.

Giridih, 25th January 1894.

Description.

Name—Mongri, Ghatwarin.
Age—18.

Widow, husband killed in 42 incline about a year ago.

Work. Children none. Works at No. 25, Serampore, carrying coal with her brother. Worked in mine ever since her husband was killed, not before. Asks how they are to live if they do not work in mines. I have to help to support my mother; if I could live without I would not work in mines. It is good for females to work on surface rather than in the mines, but they cannot get enough to keep them on surface. The women generally work with or near their male relatives and so they are not subject to temptation, they would not go to work with other persons and become misbehaved.

Work with relations.

We are not afraid of injury in the mine, but when we think there is danger we bolt.

Re-marriage. The Ghatwarin caste allows the widows to re-marry.

They marry at all ages. Working in mines is suitable for women. Their time is taken from the position of the sun and they divide the day into three hours' sections, 3 hours=Pahar. Go to work at "eke" Pahar and leave at "tin" Pahar. A year is divided into 27 nachatters.

Calculation of time.

Female.

Giridih, 25th January 1894.

Description.

Name—Dukhni, Kolhin caste.
Age—17 or 18 years.
Married—Yes.

No children.

Work. Worked in mine from childhood. Works at No. 7, Jogitand, filling dust.

Thinks it is good that females should work in mines.

Morality. They do not do things that are morally wrong, and there is no fear of that.

It is best for females to work in the mine rather than on surface.

They keep themselves from danger.

Marriage. Her husband is not living with her but has married another woman, her husband thinking her too young. Is now staying with her parents. Cannot tell how long it is since she was married, but has never lived with her husband.

*From a man who does not allow his wife or children to work in the mine.*

Description. Akbar Meah said, I am a Mussalman, from 25 to 30 years of age, and a coal cutter at the East Indian Railway Company's No. 7, Jogitand pit. I am married, and have one daughter and two sons, and live at Telodi village, west of Pachumba, about 5 miles from Giridih. My wife is still alive. I have worked for the East Indian Railway Company since childhood, and been a coal cutter since being 20 years of age. I work with a party consisting of 18 male persons. The females of my party do not work because we have sufficient work for them at home. Each of us has from 3 to 5 bighas of land, and our women are employed in cultivating it and preparing the produce, they consequently have no time to come to the mine. But those persons who have no land for the women to cultivate take them to the mine, but they would only work with relatives. I think that women should be allowed to work with relatives in the mine when there is no work for them at home. The nature of the work is such that men are more likely to be injured than women because the women only carry coal and coal dust, and the men do get injured more than women. I think that wherever women can earn most money they ought to be allowed to work. As to the morals of the females, that depends on the disposition of themselves and not on the place where they work. The women who work in mines are quite as good as those who do not work in mines. I do not think that working in mines makes any more difference morally, to the unmarried than to the married females; again I think it all depends on the dispositions of the girls whether they are good or not. The boys and girls do not mix much together in the mines, it being customary for them not to do so.

Females do not work.

Women to work in mines.

Morals.

Divorce. Divorcement takes place oftener amongst women who are left on the surface while their husbands are working in the mine, than with the women who themselves work in the mine. I would not allow my own wife to work in the mine even if there was not the land to till, but would leave her to take care of the children at home; though, if I had no work for her on the surface, and I was unable to keep my family, then I should take my wife to work with me in the mine.

There are some persons who do not earn sufficient to keep the whole family, it is then good for their wives to work. Girls are married very early here, but I think that unmarried girls should work in the mine. I do not know much as to whether other workpeople wish females to work in the mine.

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Giridih, 23rd January 1894.

Description. Evidence given by Chooramon Gope, 35, married, with wife and one son and five daughters still living. I live at Agdoni, two miles from Giridih. I am a sinking pit and mine sirdar. I have worked in mines from being 10 to 12 years of age. My wife and children have never worked in the mine. I get rupee 1 per day, and can well keep my family on that. I belong to the milkman or gwalla caste, which is supposed to be a good caste, and I am a good farmer, and have cows and buffaloes, and am well-to-do, and should not wish my wife to work in the mine. If I had been poor, with no work on the surface for my wife, I should have wished for her to work in the mine. I shall take my son to work in the mine at 15 or 16 years. I shall also take my girls to work in the mine at 15 or 16 years of age; and they can work with my brothers, uncles, or other near relatives. It is safest morally to allow the females to work with relatives only

Work.

Caste.

Wife and children to go into mines.

Morality.

and their work would be restricted to relatives, unless I knew a man of my own caste in whom I could place confidence, then I would allow them to work with such a person. The females who work in the mine are equally good with those who remain on the surface, both classes being about the same, because they can go wrong on the surface equally well. When they first go into the mine they are not well able to keep themselves from injury, but in two or three years' time they become experienced and can keep themselves from injury equally well with the men.

Why females work in mines.

As the men cannot earn sufficient to keep their family, they wish the females to go into the mine to earn wages, otherwise the women would not go into the mine; and I do not think they should go into the mine when the males can earn enough without them. The men principally cut coals and could not well do the work of carrying that is now done by the women. Boys also carry coals.

Work of men and boys.

The people of my village and colliery do not know that I am giving this evidence; it is my own opinion. Those persons who work in the mine, and know best, do not say that it is objectionable for females to do so, but those who do not work in the mines say it is objectionable and immoral; but those who have long worked in mines know that there is no more wrong doing, or fear of it, than on the surface. Even on the surface there is fear of wrong doing if the females are not kept with relatives. When the females work with relatives there is no fear for them; but if they work with others there is fear, and more so in the mine than on the surface. If a man can earn sufficient himself to keep his family, then the females should not go into the mine. The little ones that cannot work should not be taken into the mine.

Opinions of persons.

Fear of wrongdoing.

Children.

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*24th January 1894.*

Male. Description.

Evidence given by Dagon Koiri, (Koiri, a cultivator), 25, married, with two sons 4 and 2 to 3 months respectively. I am a sirdar at No. 2 Serampore incline, and have worked in mines from being 10 years of age. My wife does not work in mines, nor any of my near female relatives. Have distant female relatives working above ground at mines. If they work in mines it should be with relatives, but not with other men, because if they work with others they are liable to go wrong, being weaker than the men naturally.

Females of his family do not work in mines.

Women fear injury.

More difficult to get quietness when women are there.

The women fear injury more than the men, but they are cautious; yet when quiet is wanted to listen to the roof it is more difficult to get it when women are present. I think the work in mines can be done without the women.

Age for work in mines.

They should only work in mines as a necessity. But where there is fear of any injury, they should not be allowed to go. Girls should not work younger than 12 years, nor even boys.

---

*24th January 1894.*

Male. Description.

Evidence given by Hardayl Sing, about 33, Sirdar in No. 25 Serampore mine. Am married and have a daughter about 8 months old. Worked in mines since being 14 years of age. None of my female relatives have ever worked in mines, except a mother's sister's daughter some time ago. I think it is better for females to work in mines to help to support the family when the males alone are unable to do so. In my opinion there is no objection to females working in mines, or any likelihood of them going wrong, because they always work with relatives, when there are such, but in other cases they work with other men and women. My female relatives do not work in mines, because we are well able to keep them. If I was not able to support my family, I would gladly allow my wife and daughter to work in the mines. In mines they have to work hard and have little opportunity of doing things that the idler work on the surface would enable them to do. The females in the mines are more cautious in keeping safe than the men, and

Female relatives.

often tell the men to be careful and warn them. If a man leaves the whole of the family at home he can do less work himself, because he would be constantly thinking of his wife and children. Again, the women are for carrying coals, a work that the men are not accustomed to.

Work of females.

Caste.

I am of the Rajput caste (the warrior caste), a high caste who do not allow their women to go into the mine if they can live without it. The widows of this caste do not re-marry, and often have to work in the mine to support themselves and family: they would get less money on the surface.

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*25th January 1894.*

Name and Caste.

Work of wife.

Male.

Females to work in mines.

Caste.

Time when females work in mines.

Evidence given by Gopla Kol, 18 to 19, married, no children; a coal cutter at No. 7 Jogitand, Kurhurbari; worked in mines for 12 years. Wife does not work in mines, but looks after their own goats and other things. Have no relatives. Does not know how men could work without the women to carry the coal in baskets, unless the tubs were taken close up to the coal face; and does not know how they would be supported if they did not work in the mine. "We are accustomed to females working in mines, and think it is good for them to do so."

The Kol caste is almost like Sonthals, and the language is nearly the same. Widows re-marry. Those who are able to keep the females won't send them to work in mines. When they do work, it is not until the little ones are somewhat grown, and then the old women generally look after the children.

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*25th January 1894.*

Description.

Evidence given by Nimbai, Manjhi (Sonthal) (Manjhi=headman of village).

Age—25.

Married—Yes.

Children—None.

Wife work in mine;—Not now, but has done so, and will again when there is work for her. Could keep his wife without her working, but would not get so much, and would have to work harder.

Fear of injury.

There is no fear for them as to injury, because they are accustomed to it, nor any fear as to their morals.

Caste.

In the Manjhi caste, widows re-marry. Girls marry only after they are grown up, and marry for love.

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*27th January 1894.*

Male. Description.

Evidence given by Chetan, Dosad, age 29 years, lives at Bhandarddih near Giridih. Works in 40 Kurhurbari mine of the East Indian Railway Company as a coal-cutter.

Has worked in mines from being 10 years of age. Works with wife and brother-in-law.

Relatives.

Wife worked in mine ever since they were married 14 years ago. They have one child, a daughter 10 to 12 years, that goes to school, and is looked after by the child's grandmother. Have no other female relations working in mines.

Wages.

They earn 4 rupees a week for the three of them. He does not earn enough to keep them without his wife's help.

Work makes no moral difference.

He does not think there is any difference between females working in mines and on the surface, that they are equally good.

Good for females.

It is good for girls to work in the mine, and he will take his own girl into the mine as soon as Bara Sahib will allow him.

I would not take my girl to the mine if I could well manage without, but know no objection to women working in mines, but they should be over 10 years of age.

*27th January 1894.*

Description. Evidence given by—Mangor, (Kahar caste); living at Hursingraidih, Giridih; age nearly 35 years. Married with two boys and two girls; eldest, eight years, six, four, and two years, respectively; wife does not work.

Work. He works in 16 A, Serampore colliery, East Indian Railway Company, as coal-cutter, driving galleries.

Why women work in mines. Am not taking my wife into mines and cannot speak for others; but when they are very poor, they are obliged to take the females into mines; and there is no dishonour in it.

Women cautious. The women are cautious to avoid danger.

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*27th January 1894.*

Description. Evidence given by—Tala Meah, Mussulman; lives at Parathdihr, Giridih; age 36. Coal-cutter, No. 22 Serampore pit.

Married, with wife, three sons, and two daughters. Has a son of 18 years; the daughters are 4 to 6 years.

Wife does not work in mines. My daughter-in-law(?) (sister's son's wife), my son, and myself work together. The female has two sons and one daughter not working.

Females should work in mines. Females should work in the mine if there is not enough support without it. WOMEN GO INTO THE MINE ON ACCOUNT OF WANT, AND TO MAINTAIN THEIR HONOUR, AND NOT TO BE DISHONOURED; BUT SHOULD NOT GO TO WORK THERE BEFORE 12 YEARS.

Females cautious. Women are keeping themselves from injury, and those who cannot are not being taken into the mine.

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*Petition to His Honour the Lieutenant-Governor of Bengal praying against the prohibition of women and children from working in mines.*

To

HIS HONOUR THE LIEUTENANT-GOVERNOR OF BENGAL.

"An incarnation of justice, devout, virtuous, holy and pious, endowed with great splendour and courage, happy, and auspicious. So be it."

Having heard that your Honour is going to stop all women and children to work in the mines, your Honour's undersigned petitioners, with three thousand miners of East Indian Railway collieries, beg most humbly and respectfully to lay before your Honour this humble petition for your kind consideration and orders.

That above 3,000 men, women and children are getting their subsistence by cutting and carrying coal in mines under your Honour's petitioners' supervisions, but if the men alone are allowed to work, their children and wives cannot be supported by their poor earnings only, as one man can hardly earn Rs. 1-8 per week, while he has to support two to four children and wives, moreover, some of them has to support his old parents who solely depend upon him. Under these circumstances, Rs. 1-8 is quite insufficient to provide them with their simplest food and clothes, etc.

That the wives and daughters of your Honour's petitioners and of the miners under them cannot become unchaste when they work with their husbands and parents, and children, at one place in the mine. Women working in the mines in presence of their parents, father-in-laws and mother-in-laws, husbands and children, cannot get a stain on their characters. However, in this country, if women are left alone at home, every sort of danger may come upon them.

In conclusion, your humble petitioners pray that your Honour will be kind nough to consider your Honour's petitioners' case favourably as in duty bound hall ever pray.

*Names of Petitioners.*

| | | | | | |
|---|---|---|---|---|---|
| 1 | (Sd.) Rupon, | Sirdar for | | 300 | Miners. |
| 2 | „ Rewa Roy, | „ | „ | 100 | do. |
| 3 | „ Darbari, | „ | „ | 100 | do. |
| 4 | „ Pem, | „ | „ | 125 | do. |
| 5 | „ Lachmon Passi, | „ | „ | 40 | do. |
| 6 | „ Rewat Roy, | „ | „ | 100 | do. |
| 7 | „ Gonpot Roy, | „ | „ | 75 | do. |
| 8 | „ Ghuja Miah, | „ | General. | | |
| 9 | „ Raghu Cole, | „ | for | 125 | do. |
| 10 | „ Bundo Singh, | „ | „ | 100 | do. |
| 11 | „ Toolsi, | „ | „ | 125 | do. |
| 12 | „ Talo, | „ | „ | 75 | do. |
| 13 | „ Mohan Miah, | „ | „ | 50 | do. |
| 14 | „ Karoo Miah, | „ | „ | 50 | do. |
| 15 | „ Churamon Gope, | „ | „ | 50 | do. |
| 16 | „ Binodi Rajwar, | „ | „ | 50 | do. |
| 17 | „ Thacoori Miah, | „ | „ | 150 | do. |
| 18 | „ Roopon Cole, | „ | „ | 100 | do. |
| 19 | „ Lilo Dosadh, | „ | „ | 50 | do. |
| 20 | „ Latoo Burhi, | „ | „ | 100 | do. |
| 21 | „ Latoo Toori, | „ | „ | 50 | do. |
| 22 | „ Darbari Ray, | „ | „ | 75 | do. |
| 23 | „ Sonma Mouli, | „ | „ | 100 | do. |
| 24 | „ Bir Singh, | „ | „ | 150 | do. |
| 25 | „ Nankoo Doosadh, | „ | „ | 100 | do. |
| 26 | „ Fond Singh, | „ | „ | 100 | do. |
| 27 | „ Hurdyal Singh, | „ | General. | | |
| 28 | „ Jiton Miah, | „ | for | 150 | do. |
| 29 | „ Bisoo Bowri, | „ | „ | 100 | do. |
| 30 | „ Keso Kaher, | „ | „ | 100 | do. |
| 31 | „ Dulli Miah, | „ | „ | 200 | do. |
| 32 | „ Atal Bowri, | „ | „ | 100 | do. |
| 33 | „ Haril Roy, | „ | „ | 200 | do. |
| 34 | „ Mithoo Dhobi | „ | „ | 100 | do. |
| | | | | 3,390 | miners. |

*Dated 18th July 1891.*

*Translated by*
(Sd.) RAGHU NATH LAL.

(Sd.) JADU NATH MOOKERJEE,
*Accountant.*

*Dated 24th January 1892.*

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*Résumé of evidence, and Petition.*

Résumé of evidence, and the petition.

The general tone of the evidence and of the petition appears to be one of necessity, and of "pice," money. The females work at the mines to earn, or to assist in earning, the money that is necessary for themselves and family. They prefer to work below ground, because they can there earn more money with less work than on the surface, as well as do a proportion of the work in company with husband, brother, son, or other relative. All express the opinion that the under-ground workers are as moral as those above-ground, and that the circumstances under which they work favours morality rather than immorality, much more so than if they were left at home. Also that, not only is it necessary for females to work for the direct object of earning money, but also to help to do work that could not well be done without them.

Temperature observations.

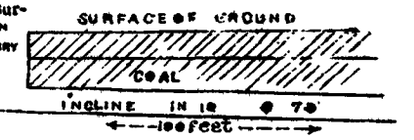
## 51. *Temperature Observations.*

The following are a few temperature readings to show the great heat above-ground in mining districts, as compared with the temperature of the under-ground workings of a few mines. So far as temperature alone is concerned, it is often a relief to escape out of the sun's intense heat by going into a mine.

Nearly all the temperatures were carefully taken by myself.

If they had been hygrometric readings, showing also the humidity of the places, they would have been more valuable. I hope to get some of these readings further on.

| Date. | Time. Railway time. | Colliery. | Surface Temperature. | Underground Temperature. | Temperature in Camp. | Temperature in other places. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1884. | | | | | | | |
| 10th April | 8-30 A.M. | New Beerbhoom Coal Company's Belroi. | 88° F. | ... | ... | ..... | In leather bag on pit top, just before descending. |
| ,, ,, | 8-45 ,, | No. 13 pit. Downcast, 300 feet deep. | .... | 84° F. | ... | ..... | In a tub on main level 80 yards from pit, on opposite side to upcast. No. 13 pit, 300 feet deep. |
| ,, ,, | 9 ,, | No. 12 pit. Upcast, 347 feet deep. | ... | 75° | ... | ..... | 120 feet on main level from No. 13, between the pits, return air. |
| ,, ,, | 9-15 ,, | Ditto | ... | 75° | ... | ..... | At bottom of No. 12 pit, thermometer in bag. |
| ,, ,, | 11-15 ,, | Ditto | ... | ... | ... | 90° F. | In Colliery office at Sitarampur, thermometer well shaded. |
| ,, ,, | 11-45 ,, | ..... | ... | ... | ... | 100° | In Railway carriage, Sitarampur to Asansole, well shaded. |
| ,, ,, | 1 P.M. to 2-30 P.M. | ..... | ... | ... | 100° F. | ..... | It was fully this temperature for several hours. |
| 11th ,, | 8 A.M. | ..... | ... | ... | 84° | ..... | Temperature rising, well in shade. |
| ,, ,, | 8-30 ,, | ..... | ... | ... | 86° | ..... | Ditto ditto. |
| ,, ,, | 3 P.M. | Sorakdie, near Asansole. | ... | 102°? | ... | ..... | This was not the temperature of the mine, but the reading of thermometer as taken from bag just on reaching bottom of No. 2 pit. Upcast 115 feet deep. |
| ,, ,, | 3-30 ,, | Ditto | ... | 73° | ... | ..... | Reading fell to this whilst thermometer was carried round workings, and same at bottom of No. 1; upcast pit 70 feet deep. |
| ,, ,, | 4-30 ,, | Ditto | 95° | ... | ... | ..... | In an outer room of colliery bungalow, shaded also by a verandah. |
| ,, ,, | 7-30 ,, | ..... | ... | ... | 94° | ..... | Now quite dark. |
| ,, ,, | 8-30 ,, | ..... | ... | ... | 88° | ..... | Ditto. |
| 12th ,, | 3-30 A.M. | ..... | ... | ... | 72° | ..... | Dark. |
| ,, ,, | 5-45 ,, | ..... | ... | ... | ... | 74° | In Railway carriage at Sitarampur station, thermometer in shade. |
| ,, ,, | 12 noon. | ..... | ... | ... | ... | 101° | In Railway carriage, Sitarampur to Asansole, shaded. |
| ,, ,, | 1 P.M. to 4-30 P.M. | ..... | ... | ... | 99° | ..... | Well shaded. |
| 13th ,, | 3-30 & 4-30 A.M. | ..... | ... | ... | 79° | ..... | Dark. Just breaking day at 4-30 A.M. |
| ,, ,, | 1 to 4-30 P.M. | ..... | ... | ... | 100° | ..... | Temperature beginning to fall. |
| 14th ,, | 6-30 A.M. | ..... | ... | ... | 81° | ..... | Sun not properly out. |
| ,, ,, | 11 ,, | ..... | ... | ... | 94° | ..... | Feeling warm in camp, both doors open, a little wind, temperature rising. |
| 15th May | 7 ,, | ..... | ... | ... | 88° | ..... | Well in shade in Barakar Dák Bungalow. |
| ,, ,, | 10-30 ,, | Bengal Coal Company's Sanctoria. | ... | 87° | ... | ..... | Round workings in Sanctoria seam, No. 10 pit. |
| ,, ,, | 3 to 5-30 P.M. | ..... | 94° | ... | ... | ..... | In Manager's bungalow, Sanctoria, well in shade, punkah going all the time. |

| Date. | Time. Railway Time. | Colliery. | Surface Temperature. | Underground Temperature. | Temperature in Camp. | Temperature in other places. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1894. | | | | | | | |
| 15th May. | 8-30 P.M. | ..... | ... | ... | 95° | ..... | Barakar Dâk Bungalow, well in shade. |
| 21st ,, | 7 A.M. | ..... | ... | ... | 92° | ..... | Ditto ditto. |
| ,, ,, | 11-30 ,, | Laik Coal Company | ... | 105°? | ... | ..... | Just on entering mine, thermometer in paper and in bag. |
| ,, ,, | 12 noon. | Ditto | ... | 79° | ... | ..... | Bottom of No. 3 pit. |
| ,, ,, | 12-30 | ..... | ... | 80° | ... | ..... | Bottom of No. 5 pit. |
| ,, ,, | 1 P.M. to 4 P.M. | ..... | ... | ... | 102° | ..... | Barakar Dâk Bungalow. |
| 22nd ,, | 6-30 A.M. | ..... | ... | ... | 94° | ..... | Ditto. |
| ,, ,, | 9 A.M. | Robert Scorer | ... | 95° | ... | ..... | Round the workings of the mine. |
| ,, ,, | 1 P.M. to 4 P.M. | ..... | ... | ... | 103° | ..... | Dâk Bungalow, Burrakar, well in shade. |
| ,, ,, | 8-30 P.M. | ..... | ... | ... | 101° | ..... | Di to. |
| 23rd ,, | 6-20 A.M. | ..... | ... | ... | 96° | ..... | Ditto. |
| ,, ,, | 7 ,, | ..... | ... | ... | 93° | ..... | Ditto. |
| ,, ,, | 9-30 A.M. | Burrakar Coal Company. | ... | 83° | ... | ..... | In the furthest part of the workings. |
| ,, ,, | 10-30 A.M. | Ditto | ... | 79° | ... | ..... | In incline, 100 feet down it from surface.   |
| ,, ,, | 3 P.M. | ..... | ... | ... | 100° | ..... | Dâk Bungalow, Burrakar, well shaded. |
| ,, ,, | 5 ,, | ..... | ... | ... | 103° | ..... | Ditto. |
| 24th ,, | 6 A.M. | ..... | ... | ... | 95° | ..... | Ditto. |
| ,, ,, | 7 A.M. | ..... | ... | ... | 94° | ..... | Ditto. |
| 22nd ,, | ... | ..... | 108° F. Verandah. | 92° | ... | 98° in office room | Temperatures sent by Dr. Saise from Giridih on surface in verandah, office room, and under-ground. |
| 24th ,, | 11 A.M. | Bengal-Nagpur Coal Company. | ... | 84° | ... | ..... | In the workings. |
| ,, ,, | 11-30 ,, | Ditto | ... | 83° | ... | ..... | Coming out towards incline. |
| ,, ,, | 1 P.M. to 4 P.M. | ..... | ... | ... | 105° | ..... | On middle wall of room in Dâk Bungalow, well shaded. |
| ,, ,, | 5-30 P.M. | ..... | ... | ... | 106° | ..... | Ditto. |
| 25th ,, | 7 A.M. | ..... | ... | ... | 96° | ..... | Ditto. |
| ,, ,, | 10-30 A.M. | Jogendro Nath Mukerji's Colliery. | ... | 83° | ... | ..... | Bottom of No. 3 pit. |
| ,, ,, | 11 A.M. | ..... | ... | 83° | ... | ..... | Bottom of No. 2 pit. |
| ,, ,, | ... | ..... | ... | 85° | ... | ..... | All round the workings. |
| ,, ,, | 1 P.M. to 4 P.M. | ..... | ... | ... | 105° | ..... | On middle wall of room in Dâk Bungalow, Burrakar. |
| 26th ,, | 5 A.M. | ..... | ... | ... | 95° | ..... | Ditto. |
| ,, ,, | 2-59 P.M. | ..... | ... | ... | ... | 110° | In Railway carriage at Jamtara Station, well shaded. |
| ,, ,, | 4 P.M. | ..... | ... | ... | ... | 112° | At Madhupur Station, in Railway carriage, well shaded. |
| 28th ,, | 6 A.M. | ..... | ... | ... | ... | 94° | Birwadi Bungalow, Giridih, we shaded. |
| ,, ,, | 8 A.M. | ..... | ... | ... | ... | 95° | Ditto. |
| ,, ,, | 9-30 A.M. | East Indian Railway, Bitagorha Colliery. | ... | 81° | ... | ..... | At end of air pipes in No. 8 gallery. |
| ,, ,, | 9-45 A.M. | ..... | ... | 87° | ... | ..... | S. W. side from No. 8 gallery. |
| ,, ,, | 10 A.M. | ..... | ... | 85° | ... | ..... | Bottom of pit. |
| ,, ,, | ... | ..... | ... | 86° | ... | ..... | Prevailing temperature through most parts of mine. |

| Date. | Time. Railway time. | Colliery. | Surface Temperature. | Underground Temperature. | Temperature in Camp. | Temperature in other places. | Remarks. |
|---|---|---|---|---|---|---|---|
| 1894. | | | | | | | |
| 29th May | 7 A.M. | ..... | ... | ... | 95° | ..... | In room at Birwadih Bungalow, Giridih, well in shade. |
| ,, ,, | 10 ,, | Kurhurbari, Giridihi | ... | 87° | ... | ..... | Round workings at No. 17 Kurhurbari incline. |
| ,, ,, | 4 P.M. | ..... | ... | ... | 98° | ..... | In room at Birwadih Bungalow, Giridih, well in shade. |
| | | | | | | Max. Min. | Birwadih Bungalow, Giridih, on verandah in shade. |
| 22nd ,, | ... | ..... | ... | ... | ... | 108° F. 85° F. | Thermometers set about 6 A.M. daily. |
| 23rd ,, | ... | ..... | ... | ... | ... | 109° F. 85° F. | Ditto. |
| 24th ,, | ... | ..... | ... | ... | ... | 110° F. 87° F. | Ditto. |
| 25th ,, | ... | ..... | ... | ... | ... | 111° F. 87° F. | Ditto. |
| 26th ,, | ... | ..... | ... | ... | ... | 112° F. 87° F. | Ditto. |
| 27th ,, | ... | ..... | ... | ... | ... | 112° F. 87° F. | Ditto. |
| 28th ,, | ... | ..... | ... | ... | ... | 111° F. 84° F. | Ditto. |
| 29th ,, | ... | ..... | ... | ... | ... | 104° F. 85° F. | Ditto. |

The above temperature readings show that many mines are much cooler in the under-ground workings than on the surface, even in the shade, in summer; some of the differences being nearly 25° Fahr. It is cooler in all the mines than on the surface in the hottest time of the day.

52. **SOME CONCLUSIONS.**

The following are some of the conclusions based on the foregoing portion of the report, and on my experience of Indian mining up to the present time:—

**Women.**

Mining work not injurious.

1. The conditions under which females work in mines is not more than ordinarily dangerous, or physically injurious to them, if proper precautions be taken. The mining females are physically straight in the body, their movements accompanied by singing, and they have the appearance of being happy.

The work is natural to them, and not over-laborious.

2. The work, in most cases, has the appearance of being quite natural to them and not unnatural, as it was in England. It is not more laborious than the ordinary work on the surface, and it is in close accordance with their ordinary social habits and customs. It is not dirtier, harder, or more masculine than the female surface labour at English mines, and not for so many hours in a day.

Have company and protection of relatives.

3. They generally work under circumstances in which they can enjoy the company and protection of their nearest relatives throughout a good part of the working shift. They work in gangs and families, and do not, as a rule, mix with any men other than relatives.

Finds them work.

4. Working in the mines provides them with labour that could not be got out of the mines, and for which they get a comparatively good rate of pay. And I did not find any distressing circumstances connected with the employment of females and children, but all appeared to be hearty and happy.

No work to do at home.

5. A large majority of the females have little or no work to do at home; and, without their help in the mines, husbands and relatives would be put to great inconvenience and trouble in doing their work.

Less miserable as workers.

6. Without the wages they earn many families would become most miserably in want as compared with their present prosperity.

Out of sun's heat.

7. When proper precautions are taken for proper ventilation and making the workings healthy, it is an advantage to them to be in the mines and out of the sun's heat during the hottest part of a summer's day, the mines being comparatively cool.

Morals.

8. Working in the mines has no more tendency to immorality than most other employments, but in a great number of cases it is of a protective nature.

Prohibition not urgent.

9. There does not appear to be any present urgency for the prohibition of females from working below-ground in mines, and I have not been able to find that the excluded would be able to get any other work to do. The industry is new, the people of the country are really new to mining work, they think a great deal of having their own way; and, so far, I have been unable to find that many accidents have happened to women and children.

Prohibition would also affect male workers.

10. Labourers are already scarce, prohibition would lessen the number, and it is probable that the prohibition of females would, at least temporarily, lessen the number of male workers as well as females. The employment in mines of wives and dependents is a great inducement for males taking to this kind of work.

Far-reaching in bad effects, without any good.

11. It would be a very untimely Act to *now* prohibit females from working in mines, and one whose consequences would be far-reaching in its bad effects, but with few counterbalancing advantages.

Prohibition would greatly hinder or even close mines.

12. Under the present circumstances in which the mines are worked, and the scanty provisions for bringing coal out of the mines, the prohibition of female labour would for some time greatly lessen the output of all the collieries; and make it impossible for some native owners to continue working: they being generally without even the least amount of colliery plant belowground, and without money to provide it, though they find work, and a means of living for hundreds of families.

Would injure and disturb all trades.

13. The lessening of the output by prohibition would make coal scarcer, raise the prices, and would in this way injuriously affect and disturb the manufacturing trades and traffic throughout India.

**Protection.**

Protection is necessary.

14. But protection should be given to females by legislation, or special rules thereby provided for, to secure the travelling roads in the mines, and the inclines out of them being suitable and safe; and the working parts properly ventilated. Also to secure that the means by which they have to go down pits shall be suitable for females.

Work of women.

15. Taking the sum total of women's work they appear to do more work than most men, for they have to act as the servant, bearer, and provider to the men, and so in various ways work a greater number of hours in the day.

Latrines.

16. Suitable latrines should be provided for surface females; these would also be available for under-ground workers where the coal is carried out to the surface, and morning and evening for those females who remain in the mine all day. The slower circulation of the air, and the greater number of persons employed near together in one place makes it more necessary than in England to have underground cleaners or "mehters." I found no latrines provided for females; somewhat curiously, there were a few for male Babus.

**Boys.**

Prohibition of young boys.

17. There are only a few boys under 10 years of age employed in the mines, and some owners will not employ them so young, therefore, all below that age could well be dispensed with; it would give them an opportunity of having time to go to school, and to get strong for the time they are required to begin active work.

**Girls.**

Young girls.

18. The age rising up to 12 years, the age of puberty for girls in India, is a critical time for females; and as the majority of them are married before reaching that age, it would appear that to fix the inferior limit of age for females at 12 years would be good for their health, and at the same time make it most likely that the greatest number of female workers below-ground would be married.

Well to give time for introduction.

19. It would be well to give a reasonable time before making any restrictions compulsory, so as to introduce them gradually as the people become accustomed to the requirements.

Total prohibition of young children.

20. The limiting of the age of boys and girls will make it necessary to prohibit all below those ages from being in the mine at all under any circumstances. There appears to be such a small number taken into the mines below the proposed limiting ages that this would create few hardships and but little inconvenience. It would also be necessary to establish a registration system of name, age, date of first employment, etc. I saw very young children in some of the mines, but not at all a great number; they were nearly all naked, many were quite in the way of the work being done, and a few in places where they were very liable to get injured.

Schooling.

21. It appears to me that more voluntary schooling, or more schools are necessary for miners' and other children rather than have them idling about in mischief. There is much room for the miners being more intelligent, they do not know how best to do work, and therefore do more work than is necessary for the result obtained.

**Other Provisions.**

Certificates.

22. Managers and Assistant Managers should be certificated as to their qualifications and experience. This would, amongst other things, greatly tend to increased mining knowledge on the part of the officials and a desire to become proficient and qualified to earn such certificates.

Plans.

23. There should be accurate plans kept of every mine, and provision made for accurate record plans being kept of all worked out and abandoned mines.

Standing water.

24. There should be suitable regulations with a view to preventing accidents from standing accumulated water.

Ventilation.

25. It should be a requirement that all mines be properly ventilated, so as to keep the galleries and working places healthy, and reasonably free from smoke and noxious gases.

Firedamp.

26. There should be suitable regulations with a view to preventing accidents from firedamp.

Shafts or outlets.

27. There should be at least two shafts or outlets constantly available for use to every seam being worked.

Care in pillar working, etc.

28. Suitable regulations should be provided for, by Special Rules, as to the presence of females and young persons where the work is more than ordinarily dangerous, as in pillar working, etc. They are not able to take care of themselves and keep themselves safe from injury as well as men; and noise, confusion, and inattention are among the worst things where a place is not quite safe.

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## 53. Young Children.

Young Children.

Much has been said, and attempted to be made out, of the question of the total prohibition of young children from mines, and it has often been asked "who will take care of the little children"? that are prohibited from being taken into the mine with their mothers. It appears to me that this will readily right itself. The under-ground workings of a mine is no more a suitable place for a nurse and her charge than it is for a child; and the arguments of the Indian Mining Association in this matter appear to annull themselves, being to the effect that women should not be prohibited from working in the mines *because there are so many*, and children should not be prohibited *because there are so few*.

Many children could probably be left at home in charge of an old female relative, or other person who would be glad to earn a little; and the parents, when without the encumbrance could easily earn a little extra money to pay for the care of the child, and everyone would be benefited by it. Again, if there

hould be any difficulty it would be easy to provide means for the care and helter of the children near the mines at a very small cost. The circumstances f all mines are such that some care is necessary to avoid injury ; and everyone hould be able, as far as that is reasonably possible, to take care of themselves. There are parts of mines, and even whole mines, where it would be unsafe to have small children ; and parts of mines where it would be conducive to the safety of the men as well as safe-guarding the women and children if only grown males were employed there.

A mine is not a suitable place to play in, and much less for children than grown up persons ; it appears to me that this is a lesson that managers should not be slow to teach, and the prohibition of children who are too young to work would leave this impression on the people.

Native owners seldom have young children in the mine.

The Native mine owners do not generally employ such young children as the Europeans do, and they discourage the taking of very young children into the mines.

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## Scarcity of Labourers.

The great problem is scarcity of labour.

54. The great problem from the owners' point of view is the scarcity of labourers. This is an advantage to the workman ; it leaves him much more independent than he would otherwise be, and he can practically claim his own terms ; but he really claims very little, it takes such a little to satisfy him. But the owners do provide their miners with land for cultivation, although that makes them still more independent of mining work ; and this goes to show what straits the owners are in for want of labourers.

Carrying coal long distances.

Owners would feel the labourers less scarce if they provided the necessary trams and tram lines for taking the trams to the coal, instead of having great numbers of both males and females carrying the coal to the trams below-ground for all distances ranging up to 1,000 feet.

olie catching.

Coolie catching in mining districts, where mining labourers are scarce, appears to be quite wrong. They take labourers away to Assam that ought to work in the mines ; yet, it is not unusual for them to be specially taken to a tea garden owned by the colliery owner of the district from which they were taken, and still he complains.

tealing each other's labourers.

There are owners, and managers too, who do not scruple in taking, it may almost be called robbing, the miners from their near, or distant, neighbours who are struggling to keep their men together, and to meet the salesman's demands for coal. This is done by sending out a more or less witty Sirdar, or other similar person, invested with a little money and instructions to meet the miners, give them money or pay for grog, and tell them of the large amounts of money and other good things that are in store for them if they will go with him, and work at his good, generous, and honourable Sahib's colliery ; and that they have only to do that and the Sahib will be their mother and their father—"*ma-bap.*"

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## Have refrained from direct personal references.

I have thought it my duty to refrain in this report from making direct personal references, as far as that was possible ; as to how far I have succeeded in this is shown by the context.

### SCOPE OF REPORT.

55. In this, the first Mines Inspector's Annual Report for India, I have endeavoured to cover, briefly, almost every department of practical coal mining in Bengal.

Also to treat of most of the varied phases of the Bengal mining people, who appear to have a fixed purpose for most things they do, and do few things aimlessly, and form a profound study from many points of view.

By this means I hope I have given such details, both in kind and amount, as will give all those who care to read them a correct insight into the conditions of Bengal mining as it is to-day; to see what has led to the conclusions, and opinions given; and to make comparisons of changes and progress at any future time.

Of mines in United Kingdom.

*Employment at Mines in the United Kingdom for the year 1892.*

56. The following summaries are given for making comparisons.

I am sorry the necessary information has not been available to enable similar information being given for India.

Effect of strike on output.

*Note.*—The strike in England in 1893 made that year unfit for comparisons, for, although the number of reported accidents was about the same as in 1892, the total output of coal was 17,461,076 tons less.

Number of persons employed.

Total number of persons employed in and about all the mines in the United Kingdom of Great Britain and Ireland, together with the Isle of Man, and *inclusive* of those employed on private Branch Railways and Tramways, and in washing and coking coal on premises adjacent to or belonging to the mines, was 721,808, of whom 6,099 were females *employed above-ground only*.

Number of persons employed in and about all the mines, *exclusive* of those employed on private Branch Railways and Tramways, and in washing and coking coal was 702,466, of whom 5,774 were females.

The above are made up as follows:—

| | |
|---|---|
| Number of males employed under-ground | 571,840 |
| Ditto „ „ above-ground, including sidings at the pits | 124,852 |
| Number of females employed ditto ditto | 5,774 |
| Ditto males „ above-ground on Branch Railways, etc. | 19,017 |
| Ditto females ditto ditto | 325 |
| | 721,808 |

Number of persons, and mines, and amount of coal wrought.

Under the Coal Mines Act, there were 3,403 mines at work, employing 549,312 persons underground, and 114,998 persons aboveground; and from which 191,954,908 tons of mineral were wrought, of which 181,786,871 was coal. There were also 19,342 persons employed on the private Branch Railways, and washing and coking coal.

Mines, persons, and amount of minerals.

Under the Metalliferous Mines Acts, there were 854 mines at work, employing 92,528 persons underground, and 15,638 persons above-ground, and from which 3,925,672 tons of mineral were wrought.

Fatal accidents.

The total number of fatal accidents was 862, and the total number of deaths occasioned thereby, 1,034.

There was one death for every 679 persons employed, or 1·466 deaths for every 1,000 persons employed.

Proportion of deaths to persons employed.

It is worth noting that in the year 1874, the number of deaths from accident per 1,000 persons employed was 1·947. And that the average for the 10 years, 1874 to 1883, inclusive, was 2·182.

Accidents at coal mines.

The corresponding figures for mines under the Coal Mines Regulation Act only are:—For the year 1874 there were 1·959 deaths per 1,000 persons employed. Average for the 10 years, 1874 to 1883, inclusive, was 2·240. For the year 1892 there were 814 separate fatal accidents, causing the loss of 982 lives; giving one fatal accident for every 816 persons employed, and one life lost for every 676 persons employed, or 1·478 deaths from accident per 1,000 persons employed.

In 1873, there were 146,867 tons of mineral wrought, under the Coal Mines Regulation Act, 1872, for each fatal accident, or 133,677 tons per life lost. The averages for the 15 years that Act was in force are, 186,100 tons per fatal accident, and 145,968 tons per life lost. The figures for 1892 are, 235,817 tons of mineral wrought per fatal accident, and 195,473 tons per life lost.

I trust we shall soon be able to tabulate similar valuable information for Indian mines.

Information wanted.

It would have been instructive at the present time, in connection with employment in mines, and the question of females and children, if such information had been available as would have enabled a comparison to be made between, say, England and India of:—

The number of persons employed per fatal accident.

The number of persons employed per death.

The number of tons of various minerals wrought per fatal accident.

The number of tons of various minerals wrought per death.

The amount of coal raised per person employed. The proportion of getters to total persons employed. And other similar matters.

India-Coal wrought per person.

*India.*—The Manager of the Bengal-Nagpur Coal Company, Limited, says, that at their Gangootiya Colliery half a ton of coal is the amount of work done on an average by two persons per day.

J. M. Mukerjee of the Begunia Colliery says, that 8 to 9 buckets is the daily work for three persons; that is, the coal value of one getter and two carriers is equal to about 2 tons; but that there are 400 persons employed, and the output is 100 tons per day, which averages a quarter ton per person as above.

Dr. Saise, Manager of the East Indian Railway Company's Collieries at Giridih, finds that in India the output is 120 tons per year per person employed below-ground, but only 80 tons per person employed in all kinds of work above and below-ground.

So far as I have been able to make out, the output of coal per person employed at the Bengal Collieries is only about a fourth of the output per person employed at English Collieries.

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## Mines Act, and Special Rules.

Report of the 8th March. See pages 28 to 31.

57. The report sent to Government on the 8th March of this year giving the outlines of a Mines Act, and Special Rules, is given herein at paragraph 41, and pages 28 to 31.

I have at present no wish to withdraw anything from that Report.

Mines Act.

I may add that the first Mines Act should be short, and very clearly and simply worded; and that the principal provision should be that providing for the establishment of Special Rules.

Special Rules.

The Special Rules would be rules drawn up principally by the Owners and Managers themselves, under suitable conditions, for the regulation of the working of the mines. And the bulk of the mining regulations could, as a start, be in the form of Special Rules.

Proposed Special Rules.

It might, perhaps, be well to have a proposed code of Special Rules drawn up by the Owners and Managers, in conjunction with the Inspector, for the Bengal mines before mining legislation is undertaken. These would be a guide to the Government when finally settling the Mining Act, and show what the whole regulations were likely to be.

There is no reason for postponing the formulation of "Proposed Special Rules" until legislation has begun; it is a matter that will take considerable time, both in the preliminary arrangements with Owners and Managers, and in settling the proposed rules.

## CONCLUSION.

Conclusion.

58. I have had a definite object in view in dealing with, and putting into this report everything it contains, *i.e.*, to deal fully and fairly within reasonable limits on every branch of this extensive subject; and I trust this has been made clear in the context.

The report will have its uses for reference, and the information it contains will form a sort of base line of the state of Bengal mining of to-day.

I have the honour to be,

SIR,

Your most obedient Servant,

JAMES GRUNDY,
*Inspector of Mines in India*

SIR E. C. BUCK, KT., C.S.I.,
*Secretary to the Government of India,*
*Revenue and Agricultural Department.*

## Appendix containing a copy of instructions issued by the Government of India with regard to the duties of the Inspector of Mines.

Circular No. $\frac{2}{15}$, dated Calcutta, the 1st March 1893.

From—SIR E. C. BUCK, KT., C.S.I., Secretary to the Government of India,

To—All Local Governments and Administrations (except Berar, Ajmere-Merwara, and Coorg).

Rev. and Agril. Dept. *Minerals.*

WITH reference to correspondence ending with letter No. , dated , I am directed to forward for copies of correspondence which has taken place between the Government of India, the various Local Governments and Administrations and Her Majesty's Secretary of State on the subject of legislation for the inspection and regulation of mining operations in India. In his latest Despatch the Secretary of State intimates his intention to select, as suggested by the Government of India, an Inspector who will visit and report upon the principal mines in this country, and to defer the question of legislation until the report of the Inspector has been received.

2. The Inspector of Mines will be placed under the general control of the Director, Geological Survey of India, who will intimate to the Local Governments and Administrations the proposed date of his visit to each province, and who will, if permitted, make arrangements for the Inspector's tour in direct correspondence with a Provincial Officer to be nominated for the purpose. His first tour will take place in the Province of Bengal.

3. It will be advisable that private mine-owners should be informed without delay of the creation and object of this appointment, and that they should be invited to allow the Inspector every facility for acquainting himself with their mines and the system on which they are managed.

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No. $\frac{2}{15}$.

COPY, with copy of correspondence with Her Majesty's Secretary of State, forwarded to the Public Works Department for information.

By Order,

J. W. P. MUIR-MACKENZIE,

*Under-Secretary to the Government of India.*

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No. $\frac{466}{15}$, dated Calcutta, the 1st March 1893.

From—SIR E. C. BUCK, KT., C.S.I., Secretary to the Government of India,

To—The Director of the Geological Survey of India.

Rev. and Agril. Dept. *Minerals.*

I AM directed to forward, for your information, copies of correspondence upon the subject of legislation for the inspection and regulation of mining operations in India as well as of a circular addressed to Local Governments and Administrations, intimating the decision of the Secretary of State to send, at an early date, an Inspector of Mines to this country.

2. In view of the importance of keeping the Geological Department fully conversant with all questions relating to mines, the Inspector of Mines, though not included in the cadre of the Geological Survey Department, will be placed under your administrative control.

3. I am to request that, on the arrival of the Inspector, a programme of work and estimates of expenditure may be prepared and submitted to the Government of India for approval. His first tour, as you will observe, is to take place in Bengal, and no time should be lost in making the necessary arrangements with the Local Government and

with the owners of mines in that Province. You should first enquire with what officer the Bengal Government would wish you to correspond in regard to matters of detail.

4. A communication will be made hereafter as regards the special subjects which are to be enquired into by the Inspector in fulfilment of the Secretary of State's instructions.

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No. $\frac{700}{15}$, dated Calcutta, the 24th March 1893.

From—Sir E. C. Buck, Kt., C.S.I., Secretary to the Government of India,

To—The Director, Geological Survey of India.

Rev. and Agril. Dept. *Minerals.*

In continuation of my letter No. 466—15, dated the 1st March 1893, I am directed to say that in the event of the Inspector of Mines arriving in India before further orders are received from the Government of India, he should be instructed to record a note on the system of labour in each mine visited by him and to pay special attention to the conditions (*e. g.*, hours of work, kind of labour, age, etc.) under which women and children are employed, with a view to the preparation of a report at the conclusion of his inspection of the mines of each province. He will be required to state in this report any conclusions he may have formed as to the necessity of issuing any regulations for the protection of labourers.

2. The Inspector should also enter in his notes such observations as he may think necessary regarding the safety of the methods under which mines are worked, the qualifications of the managers employed, and the necessity or otherwise for the establishment of a system under which managers should obtain certificates of competency.

3. It will be desirable to arrange that a copy of the note drawn up after the inspection of a mine should be forwarded to yourself for record or such further instructions as you may think fit, and, for the present, copies of the notes and of any instructions which you may issue should be submitted to the Government of India. The Inspector should also, if so desired by the Local Governments concerned, furnish another copy of his notes to the Local Government.

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No. $\frac{3064}{15}$, dated Calcutta, the 26th December 1893.

From—Sir E. C. Buck, Kt., C.S.I., Secretary to the Government of India,

To—The Director, Geological Survey of India.

Rev. and Agril. Dept. *Minerals.*

With reference to correspondence ending with this Department letter, No. 700, dated 24th March 1893, regarding the appointment of an Inspector of Mines in India, I am directed to forward a copy of the correspondence* on the subject of Mining Legislation, and to suggest that the papers may be communicated to Mr. Grundy, the Mining Inspector.

2. I am also to suggest that Mr. Grundy may be introduced to the Indian Mining Association.

3. It is left to your discretion to decide whether Mr. Grundy need be deputed to the Dandot colliery, which has, it is understood, been already inspected by an officer of the Geological Department.

4. In supersession of so much of the orders contained in my letter quoted in paragraph 1, as required the submission by the Inspector of a report after his visit to each Province, I am to request that measures may be taken for the submission, in July of each year, of an Annual Report of the work performed by the Inspector of Mines.

* A. Progs., Oct. 1892, Nos. 18—21 (without K.W. notes).
A. Progs., Sept. 1891, Nos. 13—15, (without K.W. notes).
Volume containing the Report of the Mining Royalties Commission, 1890. (Return requested)
A. Progs., June 1891, Nos. 16—18 (without K.W. notes).
Volume of correspondence *re* the International Labour Conference at Berlin. Return requested.

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No. $\frac{272}{7}$, dated Calcutta, the 27th January 1894.

From—E. D. Maclagan, Esq., C. S., Under-Secretary to the Government of India,

To—The Director, Geological Survey of India.

Rev. and Agril. Dept. *Minerals.*

In acknowledging the receipt of your letter No. 43, dated 17th January 1894, forwarding reports by Dr. Nöetling on his inspection of the Dandot and Bhaganwalla collieries, I am directed to request that the Government of India may be furnished, by the end of the cold weather, with a supplementary note by the Inspector of Mines, showing the precautions which in his opinion should be laid down generally for protection of miners against accidents.

No. $\frac{892}{7}$, dated Calcutta, the 29th March 1894.

From—M. FINUCANE, Esq., M.A., C.S., Offg. Secretary to the Government of India,

To—The Director, Geological Survey of India.

Rev. and Agril. Dept., *Minerals.*

I am directed to acknowledge the receipt of the Report by the Inspector of Mines forwarded with your letter No. 536, dated 13th March 1894, and to say that the Government of India are not prepared, with the information at present before them, to undertake legislation on the lines suggested by the Inspector. When Mr. Grundy has visited the principal mines and made himself acquainted with the facts and conditions of Indian mining, the Government of India expect to receive, and will be prepared to consider, any regulations which he may recommend for adoption with a view to legislation. In the meantime Mr. Grundy should continue his enquiries, and when he has acquired sufficient information, it would be well for him to submit a draft of Rules for the security of mines and protection of labourers on which the opinions of Indian mine-owners may be taken.

Govt. of India Central Printing Office.—No. 14, D. G. Survey.—30-3-94.—1,100.

# REPORT

OF THE

# INSPECTION OF MINES IN INDIA,

FOR THE

## YEAR ENDING THE 30TH JUNE

## 1895.

BY

JAMES GRUNDY, ESQ.,

INSPECTOR OF MINES IN INDIA.

CALCUTTA:

OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.

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# Report on the Inspection of Mines in India for the year ending the 30th June 1895. By James Grundy, Esq., Inspector of Mines in India.

CALCUTTA.

*30th June 1895.*

In compliance with the instructions of the 26th December 1893, that I should submit a report in July of each year, I have now the honour to submit my report for the year ending 30th June 1895:—

## 1.—PRELIMINARY.

### Inspection work—

After finishing my report, in July of last year, I lost no time in recommencing the work of actual inspection.

Though I have not made as many inspections in the whole year as I made in the first half year of 1894, the circumstances have been quite different, the mines visited have been much more scattered, so that I have done very much more travelling, and I have worked very hard and been busy throughout the whole year.

The number of inspections made is not by any means a measure of the amount of work done.

### Nature of the inspection work—

I have carried out the work of inspection more like a Mining Commission of Inquiry into the present state of Indian mining than an ordinary system of inspection work. This mode of procedure appeared to be necessary for several reasons. For instance, there being no Mines Regulation Act in India, there was really no mining law, or rules, or regulations, being actually enforced; I could not, therefore, go on the principle of seeing whether the mining law was being obeyed. Where there were rules that could be produced at the mine when asked for, they were to a great extent a dead-letter; their *requirements* were in some cases very little known even to the mine officials, and their *existence* appeared to be known to only a few; consequently, it could not well be my duty to see that these were being properly carried out.

### Comparison with English inspection work—

In England, throughout the United Kingdom, and in other countries, the working of the mines, the safety, health, and many other things affecting the mines, and the well-being of the employés, are regulated by special mining laws, made up, for the most part, of an elaborate series of rules, detailing what may and what may not be done under given circumstances, and how certain things may only be done.

And, in the United Kingdom, in addition to the Mining Acts, which include general rules, there is in each of the 13 inspection districts a set, or sets in some of the districts, of special rules. The number of these special rules in each of many sets goes well into the second hundred; for example, the number of special rules in the North and East Lancashire, or Manchester and Ireland district is 156. All these rules have been established in the manner provided for in the

Mines Regulation Acts, and are of almost equal lawful force with the Acts themselves. This being so, the principal duty of an Inspector of Mines in the United Kingdom, when inspecting a mine, is to see that the Mines Regulation Acts and the special rules are being duly and properly observed by all persons in any way connected with the mine: Owners, Agents, Managers, all other officials, and workmen. Also that those in authority at the mine are enforcing proper observance of the rules in such manner as is required by the Acts, and in such a way as may be best calculated to prevent dangerous accidents, and provide for the safety, convenience, and proper discipline of all the persons employed in and about the mine. Again I may repeat, there being no such Act and rules in force in India, there was none for me to see to being observed.

How the absence of rules affects the mines—

Another consequence of this absence of Mining Rules and Regulations is, that almost every mine is worked in a way that conforms most nearly to the ideas and previous training of the officials in charge; and, in some of those cases where the officials have had little mining training, and as little mining experience, the condition of the mine depends more on good fortune than on good management: and that gives another reason for making the inspections and conducting the inquiries in the way I adopted. The detailed inspections were necessary, because the mines, outside of the coal mining districts of Bengal, are so scattered over India; and the practices and methods of working the mines, in some details, are probably as much divergent as their positions. Also, the character of the future Indian mining laws and regulations will probably depend so much on present practices, and must be so framed if they are to be suitably adapted to the mines, and to the people, and be introduced with as few changes and disturbances of the present conditions and practices as is possible in the first stages of such a great and enterprising undertaking. It is also desirable to introduce this new order of things with firmness, but quietly, temperately, with a full recognition of all that can be said, thought, or felt from the workman's stand-point, and with a view to avoiding the unnecessary creation of fear and suspicion in the minds of the work people, and all the time maintaining a reasonable hope that the new regulations can, and will, be properly observed and enforced with little friction, and without any deleterious effect on the Indian mining industry that it is intended to benefit. I felt, therefore, that it was quite essential to ascertain the practices and methods at present prevailing in the working of mines throughout India; as well as try to find out what has apparently been found to be the best in dealing with the mining people. The information thus gleaned will be a valuable guide, not only when considering what form the regulations should partake of, but also when introducing them into practice, as well as being a guide and help and source of valuable information for future Inspectors and inspections.

Another object for making the inspections and information collected as complete as possible, was to enable me to have a full and proper grasp of the details of Indian mining, so as to be able to advise rightly with respect to necessary and suitable mining laws and rules.

The details need not be gone into so minutely when making future inspections of the mines that have been previously inspected and inquired into in detail.

## Objects of sections of this report—

Many of the statements, and much matter given in this report, is given principally for four very important reasons:—(1) Mine owners and officials, especially those who have never been out of India, and probably who have never been far from home, are continually asking as to how things are done at the best collieries in India, and in England, and in other places; and as to how they will be able to do certain things that they think the Mines Act will require. I have made statements, given examples of forms, etc., with a view to assisting such enquirers and all others requiring the information. (2) Officials, especially natives, have often expressed doubt and a kind of ingrown fear of the fearful something looming in the near distance, that is now popularly known to them as a Mines Act and regular inspection. I have tried to do something to allay fear, and remove room for doubt on a few of such matters. (3) Some matters have been dealt with, because such information is necessary for the purpose of avoiding accidents. (4) There are certain established principles that I think it is advisable to record for reference, in this early stage of Indian mining, some of which should be especially considered in relation to proposals for Indian mining rules.

## Nature and objects of mine inspection —

As to mining inspection by a Government Inspector of Mines, it will help to clear the way; make known to all concerned what it is, and what they may expect; it will be to some extent a guide to all future Mine Inspectors, both regular Inspectors and *ex-officio*; and serve as a base of operations for all official action in this matter, if I briefly set forth what I believe should be the aim, object, and method of procedure of Inspectors and inspections in India, when mining legislation and inspection is fully established. The remarks are based on the principles of mining inspection in the United kingdom:—

1. It should be unnecessary to lay down a rule that the conduct of every-day life and intercourse with our fellowmen requires, but courtesy and forbearance enters so largely into an Inspector's work, and regulates his success to such a large extent, that it is not out of place to say, that, in the exercise of his official duties, the Inspector should not fail to act with courtesy and forbearance to *all persons* with whom he may be brought into contact; being especially careful to conduct himself with strict impartiality in all matters; and should take advantage of any opportunity that offers for him to assist in promoting a good feeling and understanding between the employers and the employed, but without any meddling interference on either side. It should, then, be the right of everyone to expect from the Inspector courtesy, forbearance, impartiality, and any reasonable help; and the Inspector should be most careful not to do anything to forfeit the confidence and good faith that all may reasonably have in him. If this is maintained on all sides inspections will have good effect.
2. When there is an Indian Mines Act, one of the principal objects of inspection will be to promote and enforce the uniform observance of the legal obligations which it casts upon mine owners, and all other

officials who have the charge and management of mines; and upon all persons employed in or at the mines, to carry on their operations in conformity with the mining law and rules. The mining law and inspection will tend to bring about uniformity of practices, for any irregularity of practice, to the extent that it is suffered to pass unchecked, will take away the protection of the law from those for whom it was intended, and it would create an injustice as between different mine owners; because, those who conduct their mines in accordance with the law will be placed at a commercial disadvantage as compared with those who disregard it with the object of saving some outlay, or for gain in other ways. Opinions of this nature have been several times expressed, during my inspections, by the mining people of Bengal, and statements were at the same time made as to the probable effect of inspection and legislation on the small native mines, as well as the comparative effect on the different classes of mines; and, I believe, I am quite right in saying that some disappointment was felt in certain quarters, and joy in others, when it was found that the Inspector of Mines *did not* object right and left to all sorts of crude and unorthodox ways of doing things, and systems of working mines, so long as it appeared to be safe. But the Inspector had previously had a very large mining experience, and had seen such things many times before, and was, therefore, not in the least taken aback or surprised. It should be clearly understood by all mining people that it is not likely to be any part of the multifarious duties of the Inspector's office or position to take any part in the management of mines, or the ordering of men; or to enforce any particular system of working or mode of ventilation, or interfere in any way with the working of mines, *so long as they are worked safely*, and the law is fully observed. The duties of management, and everything connected with it, devolve solely on the owner and any officials he may appoint to act in the management of his mine; and what should also be as clearly understood and appreciated is, that the full responsibility rests with the same persons.

I wish also to impress on all mining people, with all the force possible, that the Inspector does not go to the mines to tell people what they ought, or are required to do, but to see that such *is being already done.* The ideas on this point are very crude in India, and even in England after so many years inspections.

3. Such questions as the following have several times been asked and discussed in my hearing:—"How often will inspections be made?" And "will the Inspector make the managers acquainted beforehand with his intention of inspecting the mine, by giving particulars of time and date."

I may say, in a general way, that I never sent word of my intended inspections in England; but on going over to Ireland for inspection purposes, the arrival of the Inspector in a mining district very soon became known, and its object was obvious to every one interested. This will probably be the procedure in India, though the circumstances of the country, and the position of some mines relatively to the manager's residence may often make it necessary, and much the best for all concerned to make the officials acquainted beforehand with the particulars of an intended inspection.

I may say, that I attach little importance to the idea that if the Inspector sends word beforehand of his coming they will be sure to

have all defects remedied, or, in some way, hidden before he arrives. I agree that something of this may be done, and that the hiding may be made complete by falsehood and cunning; but it is not likely that a real and bad defect will be put right in a few hours, or a day's notice, so as to either deceive or satisfy me; and if such an effort was made to have the mine made right in every way for the visit of the Inspector, one of the objects of inspection will be gained, namely, to have the working of the mine in compliance with the law, and this would only have been done because of the inspection.

When inspections may be made—

(*a*) The Inspector would probably make an effort to inspect the place of, and investigate, all reported fatal and serious accidents, and he may then take the opportunity of making a complete inspection of the mine.

(*b*) He will probably inspect on all occasions when a credible and reasonable complaint is made, if it is such as can only be properly dealt with by inspection and enquiry at the mine.

Mining people need not be afraid of sending proper complaints, the source of the complaint will be kept strictly private, and great care taken to avoid giving a clue to its source, or casting suspicion on any person; but malicious or revengeful complaints should not be made. Whilst the Inspector may be expected to steadily discountenance any personal complaints against employers, or frivolous complaints of any sort, there should be no doubt that any information showing that illegal or dangerous practices prevail at any mine will receive prompt attention. Such information may give valuable help to the Inspector.

(*c*) He may also take the opportunity of making a complete inspection whenever he has occasion to visit the mine for any special purpose.

(*d*) He may also make inspections at other times. The information that will come to his knowledge from time to time in the course of the regular discharge of his duties may lead him to take this course, especially if he has any reason to believe that the working of the mine is not being conducted safely, or otherwise satisfactorily, or in accordance with the mining law and its rules. Or, he may make such occasional inspections on the principle of devoting all the time he can spare to the inspection of those mines where he thinks it most likely to be of service.

Warning of such an impending casual inspection would not always be given, because there can be little doubt as to the fact that the liability to an official inspection at any time without warning may be made a most effective guarantee against abuse; and an unexpected visit from an Inspector may not be the less beneficial because he finds nothing of which to complain, or because the manager is absent from the mine at the time of inspection; in fact the experience is, that the absence of the manager is sometimes desirable.

4. One other point. Though inspection may, and probably will do much to secure the safe working of mines, too much should not be expected from it; much of the safety, and the danger, is often in the men's own hands, and they can do much in many ways for their own safety that they too often neglect to do. Unfortunately, the offences against what is required for their own safety are numerous amongst such a numerous body of workmen; I would, there-

fore, impress upon all workmen at mines that they, no less than mine owners and officials, are under an obligation to act in conformity with the requirements of safety, and to observe the provisions of any law or rules in force for securing this or any other beneficial object.

## 2.—THE YEAR'S INSPECTION WORK.

Having thus fully set forth the objects of inspection, the principles on which an Inspector may be expected to act in the discharge of his duties, when and how the inspections may be made, and what may be expected from Inspectors and inspections, I will now give detailed particulars of the result of my actual inspection work since submitting my last annual report.

In compliance with previous arrangements, I left Calcutta by sea on the evening of Wednesday, the 15th August 1894; and, travelling *viâ* Madras, I arrived in Bangalore, Mysore State, just after dark on the evening of the 22nd August.

My first inspections for the year were of the gold mines in the Kolar District, Mysore State, South India. After completing the inspections of each set of mines during the year, I drew up and submitted a detailed report on each mine inspected.

The following is a list of the mines inspected during the year; the size of the reports submitted in printed foolscap pages; and the dates of the reports. The order is that in which the inspections were made:—

MINES INSPECTED.

| | | Reports. |
|---|---|---|
| Kolar Mines. | 1. South-East Mysore Gold Mining Co., Ltd. | Jan. 1895, 168 pages. |
| | 2. Mysore Reefs Gold Mining Co., Ltd. | |
| | 3. The Mysore Gold Mining Co., Ltd. | |
| | 4. Balaghat Mysore Mines, Ltd. | |
| | 5. Champion Reef Gold Mining Co. of India, Ltd. | |
| | 6. Oorgaum Gold Mining Co. of India, Ltd. | |
| | 7. The Nundydroog Co., Ltd. | |
| | 8. The Mysore West and Mysore Wynaad Consolidated Gold Mining Cos., Ltd. | |
| | 9. The Nine Reefs Gold Mining Co., Ltd. | |
| | 10. The Coromandel Gold Mining Co. of India, Ltd. | |
| | 11. The Gold Fields of Mysore Co. of India, Ltd. | |
| In Mysore, but not in Kolar. | 12. The Kempinkote Gold Field, Ltd. | |
| | 13. Mysore Harnhalli Gold Mining Co., Ltd. | |
| | 14. Honnali Tribute Syndicate | |
| | 15. Honnali Prospecting and Gold Mining Co., Ltd. | |
| Central Provinces. | 16. Warora Colliery | Jan. 1895, 20 pages. |
| | 17. Mohpani „ | Apl. „ 25 „ |
| | 18. Umaria „ | May „ 26 „ |
| Hyderabad (Deccan). | 19. Singareni „ | Aug. „ 52 „ |
| Bengal. | 20. East Indian Railway Co.'s Kurhurbari Colliery, Giridih. | |

The total number of separate and distinct underground inspections made during the year was 55; the whole of these were made at the above-named mines.

## 3.—THE "KOLAR GOLD MINES," MYSORE STATE, SOUTH INDIA.

The following are the details of the inspections of these mines, that are of general interest, and in no way confidential:—

The inquiries connected with the inspections practically began on the 24th August, when I saw, by appointment, Colonel P. D. Henderson, C.S.I., then Resident in Mysore, at the Residency. I again saw the Resident on the 25th; and on the same day I saw, by appoint-

ment, Sir K. Seshadri Iyer, K.C.S.I., the Dewan of Mysore, at his residence in Bangalore.

Assistance received—

The Dewan very kindly issued instructions to the Deputy Commissioner, and the special Magistrate, to give me whatever assistance they could, and that was done. The local Inspector of Police also gave me valuable assistance. All the mining officials very readily and kindly gave me every assistance in their power; and Dr. O'Donnel also gave me valuable help and information: I, therefore, wish to record my hearty thanks to one and all who did so much to make the inspection a complete success.

The work done for the inspecting of the mines here included:—

Work of inspection—

*First.*—Twenty-nine underground inspections, during which nearly all the working-places and travelling roads were visited. On each occasion every particle of my clothing was wetted through.

*Second.*—A thorough inspection of nearly all surface works, and tops of nearly all shafts, whether in or out of use.

*Third.*—A great number of visits to mines and mine offices, for enquiries and writing out notes.

*Fourth.*—The places of five fatal accidents below ground were inspected shortly after the time of accident, and the causes fully inquired into. I also investigated two other fatal accidents.

*Fifth.*—I attended three inquests, at the request of the special Magistrate, on the causes of three deaths by accidents in the mines. At these inquests I gave evidence as to the circumstances, and the probable causes; and helped the Magistrate to get the necessary evidence from the witnesses to elucidate the causes.

*Sixth.*—I inspected as to fencing a large number of unused shafts that do not appear to be under the control of the present Mining Companies.

*Seventh.*—Also made visits to mining camps and adjacent villages, schools, hospitals, water-supplies, and magazines for storing explosives.

*Eighth.*—The inspections and collection of facts and particulars required a large amount of writing every day.

The following short summary of particulars will help to show the extent of the mining operations on this "mining field," and the labour involved in making a thorough inspection.

Extent of mining operations—

The present workings cover a tract of country almost exactly nine miles long. There are upwards of 62 shafts in use, and a large number out of use. The depths of the shafts in use vary from about 30 feet to nearly 1,500 feet; several of them are considerably over 1,000 feet deep, and quite a large number over 500 feet.

Ladders as a means of ingress and egress is the universal rule; so that to get into, and out of, and about the mines during the 29 underground inspections, I travelled along 27,314 feet, or nearly $5\frac{1}{4}$ miles, of ladders in shafts, winzes, etc.; and 4,378 feet, or over $\frac{3}{4}$ mile, along shafts in cages and skips; and very many miles of underground levels. There were more shafts than one included in an underground inspection.

There are about eleven distinct Mining Companies, nine Superintend-

ents in charge, nineteen Mine Captains and underground foremen, and a large number of other officials.

The underground employés number 7,000; and 5,360 are ordinarily employed aboveground, in addition to a large number of extraordinary employés.

The number of underground employés at these few mines is about one-third of the total number employed underground at all the 825 metalliferous mines in the United Kingdom, including the Isle of Man. And the number of aboveground employés is more than one-third of the number employed at those mines. This shows that, for metalliferous mines, the number employed at any one mine is great. Much of this is due to the fact that the work done per man, in India, is very little. But the accumulated work done at these mines, on any one day, is very great, for the mines are extensive, and are worked energetically.

Shots fired—

About 86,700 shots are fired per month to loosen the ground, consuming 44,000lbs., or over 19 tons, of explosives per month.

Quantity of candles used.—

There is also used per month for lighting belowground over half a million in number, 73,500 lbs., or nearly 3 tons, of Gouda Stearine candles that are made in Gouda, Holland, with a retail value of ₹36,750.

Amount of gold produced—

The quantity of bar gold produced for the year ending the 30th June 1894 was 199,690 ounces, with a certified value of £757,212 sterling.

Direction of the lodes and the mines—

The lodes run in a nearly north and south direction, consequently the whole of the mines are in a nearly north and south line. The most southerly mine is Mysore Reef; and this mine occupies the unique position of being the only mine included in the "Kolar Gold Field" that is outside of the Mysore State. It is situated in the Madras Presidency, but close to the boundary dividing that Presidency from the Mysore State.

Size of mining field—

The most northerly workings are two prospecting mines belonging to the Gold Fields of Mysore Mining Company, and almost exactly nine miles in a straight line from the Mysore Reef Mine. This is, at the present time, the length of the mining field; its breadth is comparatively small.

Languages spoken—

There are many languages spoken at these mines, including English, Italian, Tamil, Telugu, Kanarese, Maliálum, etc., but Tamil is the principal native language spoken.

Prosperity due to mining—

The foregoing is sufficient to show that gold mining is being carried out on an extensive scale in this district, and being done energetically. It finds employment for large numbers of men from many parts of India. A great quantity of material is used, both Indian and foreign, such as coal, timber, explosives, iron, steel, steel wire ropes, engines, boilers, other machinery, mercury, chemicals, oil, candles, antiseptics, paints, paper, food, clothing, and drinks. The

benefits arising from the use of all these materials, and many more not named, reach far and wide; but they are most apparent in the adjoining and neighbouring villages, and in the towns within easy reach of the mines. Such a great industry must be a great benefit to the surrounding country, and that is plainly the case. It may be seen in the every-day life of the people: at the railway stations, especially at or near the pay-days; at the daily and weekly bazars; at the monthly *hât* on pay-days; and the springing up, with almost mushroom growth, of very large numbers of village huts; places for buying food and drink; and really fine and large buildings for a hospital, church, chapels, recreation halls and reading rooms, fine officials' bungalows, *musâfir* bungalows, and a frequently used *kachahrí*. The mining district appears to be most behind in schools. The Roman Catholic School appears to take the lead, in fact, I believe it is the only school, if the two or three held in small *kutcha* huts be excepted.

Such an industry, that converts a rocky jungal into a hive filled with prosperous people, and whose prosperity radiates for miles around, and even reaches beyond the seas, deserves, and can reasonably claim, every encouragement in return; for it is nothing short of a blessing to what was previously a poor and wretched *jungal*, and a place whose prosperity would probably vanish quickly into oblivion if anything should so unfortunately happen as to close, or even to greatly reduce the output of gold from the mines. I mention this now, because the previous poor state is liable to be forgotten so soon after great prosperity prevails, in respect to the proper share that the mining contributes to the general as well as the special welfare, the prosperity being looked upon as natural, and more or less certain; and the rights and claims of those to whom it is due do not always receive full recognition.

Another allied matter that may well be mentioned here is, that the success of these mines appears to be almost solely due to the most dogged perseverance of Englishmen, or those who may well be styled foreigners to India. The pioneers of these mines worked on and on, and spent their fortunes in proving the mines; they certainly worked and spent money in what was to them the sure and certain hope that the mines would provide their own reward; and the country at large, and the owners of the present day, are reaping the reward of the early labour and spending. The same thing is going on to-day, in this same mining district; with the exception that they have all the previous and present work and known conditions, and experience to guide them, as well as perhaps to give them false hopes.

It is no secret that ten out of the fourteen mines visited are working at a regular heavy loss, and have been doing so for many years; and other companies have done the same as long as they could, and then had to retire with empty purse and blighted hopes. It is clear then that all the prosperity previously referred to comes from the few successful mines, and the greater number of mining companies who are finding work for the people, and spending money in the hope that they will be some day rewarded.

## Mining terms—

The terms used at metalliferous mines throughout the world generally vary from those used at coal mines, so that it may be well to explain what are the official names of the principal officials at these mines, and the nature of the positions they hold; and, further on, I give a glossary of terms to meet an expressed want.

Superintendents—

The official title of the principal, who has general charge of all operations both aboveground and belowground, is Superintendent. These Superintendents, almost without exception, have had a long experience of metalliferous mining; several of them began actual work in the mines when they were quite young boys, and gradually worked their way up to the higher position of Mine Captain, a title by which they are generally and best known even now that they are occupying the superior positions of Superintendents. All the Superintendents appear to be qualified for the many duties of their onerous offices, and appear to realize the responsibilities of their position in relation to both the owners and the work-people.

As Superintendents of all the mining operations, their time is divided amongst too many things to be able to make underground inspections daily, but I believe they do, without exception, make frequent inspections of the underground workings, a few doing this nearly every day.

Mine Captains—

There are four recognised titles for the persons who have the principal charge and control of all underground operations, namely, Captain, Chief Mine Agent, Chief Underground Agent, and Underground Foreman. The first three are used synonymously, but Captain is the term by far the most often used; and it is also regularly applied to the Underground Foreman, although his position is really inferior to that of Captain.

These officials make daily underground inspections; but, under ordinary circumstances, they have no control of operations aboveground. They are men who have worked in mines, principally metalliferous mines, all their working life, and have considerable skill in this kind of mining, and in the management of men. But, as a rule, officials and others employed at metalliferous mines have not much experience of matters specially connected with coal mining; and *vice versâ*.

Other officials—

Pitman is the term applied to the person who has charge of the pumps and all other machinery in the shafts. And the persons who superintend the securing of the ground and the fixing of all securing timbers in the shafts and every other part of the mine are called timbermen. But the pitmen and the timbermen act under the control and directions of the Captain. The surface operations are principally directed by the Engineer and the Reduction Officer under the control of the Superintendent.

Examination by workmen—

It is generally supposed that the workmen frequently examine their own working-place as to its safety, and that if they find a part that appears to be unsafe they will keep from that part, and report the danger to an official; but from what has come under my notice when inspecting, and the investigation of three fatal accidents by falls of rock, one of which was certainly avoidable, I am almost forced to the conclusion that the examination by workmen is, in a great number of cases, of very little value. Many have not had the necessary experience, others are apparently careless; it is not a part of their work to put right any defects, and the work for which they are paid occupies almost their whole time and leaves them little leisure or room

for delay; consequently, the performance of the allotted work with the least interference is one of the principal objects they aim at, and much is set aside to accomplish this object; and these points should always be remembered when dealing with matters affecting the safety of working-places. Nevertheless, the examination by a workman of his own working-place is one of the greatest safeguards against danger that he can avail himself of, and it is in every workman's power to do so as well as being greatly to his advantage; provided he will keep from any *known* danger, and report it to the other workmen affected, and to his superiors, if it is not his duty to make it safe. It is of the highest importance that mining workmen should know how to look after their own safety; as far as possible keep from danger; and report any observed defects to the officials, and to any persons likely to be affected by it.

## System of working—

The system of working out the vein stuff in these mines is, with various modifications, the one adopted generally in metalliferous mining. Although one might occasionally object to some of the details of the way some particular part was being worked, I do not think I should in any way object to the system of working, or the general modes of carrying it out. All the mines are being worked, with slight differences, in much the same way.

## Ventilation—

The quantity of air circulating through each of the mines to ventilate them is never measured, and is not known. In some parts there was very little circulation indeed. There were only a few doors and stoppings used, in all the mines together, to direct the ventilating current. And there was no ventilating apparatus, such as a furnace or fan, at any of the mines for producing a ventilating current of air. A current is kept up by the natural heat of the mine, etc.; and the cold exhaust air from the compressed air drilling machines is a valuable auxiliary that keeps many a working-place comfortably cool that would without it be uncomfortably warm. Though many working-places were warm, with little moving air, and that almost saturated with moisture, the ventilation, as a whole, was fairly good; and I did not find any working-place really bad in this respect, or the presence of any noxious gases. At the same time, where there is such a weak ventilating current as prevails in some parts of the mines, the atmosphere must be uncomfortably charged with deleterious fumes for rather a long time after a series of shots have been fired in those places; and the workmen should know, and act accordingly, that it is absolutely necessary to their health to keep out of such places longer after shot-firing than would be necessary with better ventilation. I do not mean to infer that the ventilation of these mines is any worse than that of most metalliferous mines, but it might be improved.

## Temperature and humidity of the air—

The healthiness and comfort of the mine workings depends greatly on the temperature and the relative humidity, as well as on the quantity and purity of the air. A warm and dry atmosphere is generally more supportable and agreeable, and less oppressive, than a cooler atmosphere with a greater relative humidity; I, therefore, made numerous hygrometric observations.

Shafts—

All the shafts have a rectangular area; and generally have the same inclination as the lode, but a number are vertical for distances varying up to 300 feet deep. Twelve of the shafts were between 500 feet and 1,000 feet deep; three between 1,000 feet and 1,500 feet; and one about 1,500 feet deep.

How persons enter and leave the mines—

The way into and out of the mines is almost entirely by travelling along ladders, even to such great depths as above indicated. But the Mysore Gold Mining Company have just completed a vertical shaft, called the Riblesdale's shaft, and have connected it with the lode at the 1,060 feet level as measured down Rowse's shaft, which is on the underlie with an angle of about 45°; and intend, ultimately, to connect it with the lode at about 1,460 feet as measured down the same shaft. This new vertical shaft will be used both for winding minerals and lowering and raising employés.

Enginemen, and boilermen—

The officials appear to make an effort to secure experienced, and only full-grown men, for enginemen and boilermen. But I heard of several cases where the enginemen had made awkward mistakes; and also several recent cases of the boilermen allowing the boiler to run short of water, and burning out the fusible plug. They have evidently had narrow escapes from boiler explosions. The engineers appear to have some misgiving as to whether the native enginemen can safely be trusted to wind men up and down the shafts. The universal practice on the field of using geared winding engines makes it much easier for these men to work and to control the engines, than if they were direct acting engines. Native enginemen are regularly trusted, and safely wind persons down and up the *coal* mine shafts in India, even with direct acting engines that move the cages more quickly, and require greater care than those on second motion.

As to fencing tops of shafts and side entrances—

The tops of used shafts were generally fenced; this also applies to unused shafts under the immediate control of the present companies; but there were abandoned shafts near the south and north ends of the field that were not well enough fenced, and that should not be lost sight of by the local Government officials.

Signalling—

There was little to complain of in the signalling arrangements; but it would be well if the same code of signals were in use at all these mines, and were printed and posted up in a position and form that the workman could read, so that persons changing from one mine to another would always have the same signals to work with. I believe the same code for the principal signals is now being adopted at all these mines.

Ladders—

The question of ladders is a very important one as to the positions, sizes, and use of ladders and ladder-ways.

I drew up the following *suggestions* during the time I was inspecting here, and asked the Superintendents to give me their opinions, I

therefore put their opinions opposite to each suggestion, and it will be noticed that they were generally favourable:—

| Ladders. | Suggestions as to ladders. | Opinions and remarks of Mine Superintendents. |
|---|---|---|
| Minimum inclination. | 1. Not to be in an overhanging or vertical position, nor to have a less inclination *from the vertical* than 1 foot for each 10 feet in length of the ladder. | "Approved."<br>"This is being dealt with in the Mining Board Rules."<br>"Add as follows—unless in the case of an old vertical shaft in which there is not room to give the desired inclination to the ladders." |
| Inclination.<br><br>Sollars.<br><br>Size of footway.<br><br>Fencing. | 2. Any ladders with not more inclination from the vertical than 2 feet for each 10 feet in length of the ladder must not be more than 30 feet long; and the top end must be 3 feet above the sollar at that end, or may be as little as 1 foot, if a secure staple for handle is provided at 1 foot above the ladder rung, and another staple at 1 foot above that. And must have a suitable sollar at the foot of each such ladder, the sollar not to be less than 15 inches wide at any part. The footway to have a width of not less than 30 inches, and a length equal to the width of the shaft inside of the timber; and to be suitably fenced from the other part of the shaft, especially at the sollars. | "Approved."<br>"Being dealt with in the Mining Board Rules."<br>"If the top of a ladder is not 3 feet above the sollar, staples should be driven in secure places not more than 20 inches apart."<br>"I assume that in prospecting shafts, which are usually of small dimensions and shallow depths, the rule as to size of footway, etc., would not be stringently enforced." |
| Relative position. | 3. Ladders with a less inclination from the vertical than is set out in No. 2 must be in a similar direction or position in the shaft, or in such other suitable position as will avoid the sollar hole, or hole for the ladder-way, being immediately under the foot of the ladder above it, or a direct continuation of the ladder-way above it. This is met by having the ladders nearly parallel, and the top of each resting against the same side of the shaft, as figures 1 and 2. | "Approved."<br>"I think that some such way as shown in numbers 1 and 2 should be adopted, if practicable, in existing shafts." |
| Sketches of positions of ladders and sollars. | The form shown in figure 3 is the one objected to. | |
| Ladders to be fastened. | 4. Each side of every ladder to be securely fastened to timber sets, or firm stays of sufficient strength, in at least two places; an exception being made in the case of a bottom ladder when sinking. | "Mostly approved."<br>"Being dealt with in the Mining Board Rules."<br>"Sufficient stays might be substituted for 'timber sets.'" |
| Ladder-way to be kept clear. | 5. No rope, chain, knocking line, pipe, or anything else to be allowed to be in the ladder-way, so as to interfere with the free and full use of the ladders. | "Approved."<br>"Is being dealt with in the Mining Board Rules." |
| Raising and lowering workmen. | 6. Every mine, over — feet deep, to be provided with suitable and safe means for daily lowering and raising all persons into and out of the mine. | "This mainly depends on the finances of the company. Personally I should like to see hoisting appliances arranged for from the commencement of a mine, but any way should certainly recommend such means for mines of a depth of 1,500 feet."<br>"I do not see any objections to all the suggestions being carried out."<br>"I suggest 1,000 feet vertical below the surface."<br>"This rule is to the interests of all companies to carry out at suitable depths to prevent fag."<br>"I should say the depth would be fixed according to the position and state of affairs of the mine." |

## POSITIONS OF LADDERS AND SHAFTS.

Fig 1.

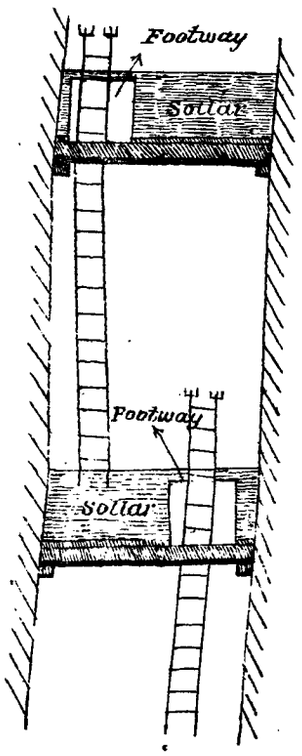



Fig 2.

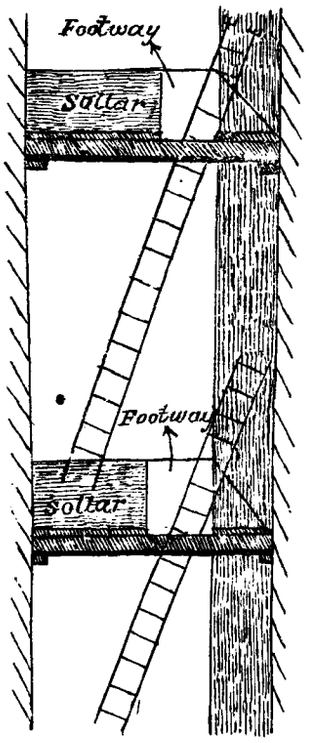
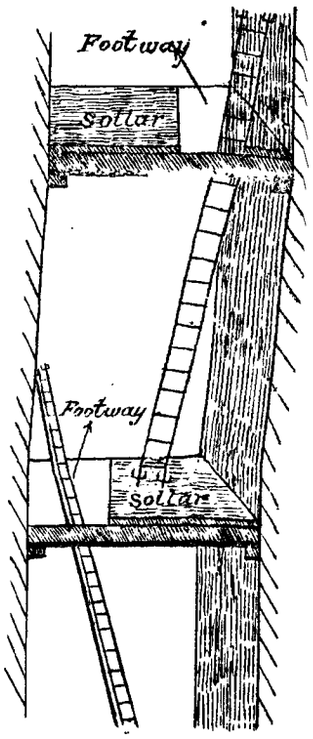



Fig 3 bad




The above sketches show some of the positions in which ladders are fixed in shafts, and the position that may be considered to be the least safe is No. 3 as shown above. The sketches will make the meaning of the foregoing suggestions clear by showing the positions, and explaining a few of the terms used :—

*Ladders.*

| Name of mine. | Length of each ladder. | Total length of ladders in shafts. | Inclination. | Remarks. |
|---|---|---|---|---|
| | Feet. | Feet. | | |
| 1. Mysore Reef . | 15 to 30 | 560+ | Nearly vertical. | These ladders were somewhat difficult to travel along. |
| 2. South-East Mysore | 15 to 30 | 510+ | Do. . | Ditto ditto. |
| 3. Mysore . . | 20 | 6,152+ | Inclined . . | Some of these ladders were at an angle of 45°. |
| 4. Champion Reef . | 20 | 2,060+ | Do. . . | Some were nearly vertical and difficult to travel along. |
| 5. Nundydroog . | 20 to 30 | 3,824+ | Do. . . | ..... |
| 6. Oorgaum . . | 20 to 30 | 3,630+ | Do. . . | Some were nearly vertical. |
| 7. Tank Mine . . | 30 | 867+ | Nearly vertical . | These ladders were difficult to travel along. |
| 8. Coromandel . . | 21 | 920+ | Inclined . . | ..... |
| 9. Balaghat . . | 20 | 1,330+ | Do. . . | Some ladders were nearly vertical, others that were inclined had the sollars or platforms a long way apart. |
| 10. Nine Reefs . . | 25 to 30 | 1,138+ | Do. . . | ..... |
| 11. Gold Fields of Mysore. | 20 | 570+ | Some were almost vertical. | These ladders were difficult and somewhat dangerous to travel along. |
| 12. Kempinkote. . | 15 | 485+ | 75° to 85° from the horizontal. | ..... |
| 13. Honalli Tribute Syndicate. | 14 to 23 | 195+ | Nearly vertical . | These ladders were difficult to travel along owing to them being nearly vertical, and but little space. |
| 14. Harnhalli . . | 33 | 230+ | Do. . | I did not go along these ladders. |

This question of ladders is one of supreme importance, as affecting safety at these and at all other metalliferous mines; in fact there is, probably, only one other matter of such great importance as affecting safety, and that is the use and abuse of explosives. Ladders are not much used at coal mines.

Chains—

No chains were in use for lowering and raising persons.

Machinery—

Most of the dangerous moving machinery was properly fenced; a little of the fencing was of recent construction, and some that had not been completed was finished after I arrived.

Winding ropes—

All the wire ropes in use were said to be made of good quality steel; and to have come from good makers. They were all round ropes and were apparently of adequate strength when new. For the rough and continuous use that these winding ropes are put to, ten as a factor of safety is not at all too much, *i.e.*, the load a rope has to support, including the weight of the rope itself—called the working load—should never be greater than one-tenth of the weight the rope is able to support without breaking; in other words, the breaking strength of a rope when new should be at least ten times the working load. The wire ropes were, apparently, fully of this strength; yet the average life of the ropes, or the average length of time they were used, was very short; and there have been cases of ropes breaking. The reasons for this are numerous, and may be summed up as continuous rough usage: this in detail includes small drums to engines; small pulleys on the headgears or poppet-heads; shafts not straight, and varying in inclination requiring an extra number of pulleys or rollers that are not always kept in good working order; and the rubbing against the sides, roof, floor, loose pieces of quartz and other stones, and worn and fast pulleys. The requirements of the ropes to meet all these circumstances are conflicting. The rope must first of all be of a suitable size and strength; but small drums and pulleys are not suitable for thick ropes, unless the ropes are made to be very pliable. This condition of pliability may be met by having the ropes made of a large number of rather thin wires of a moderate degree of hardness, or a less number of thicker wires with a less degree of hardness. The element of friction requires hardness so that the wires will wear down slowly, this is in favour of the thin hard wire ropes; but friction also requires thickness, so that there will be more substance to wear down; this is in favour of ropes made of thick wires, and these are the kind generally used. There is plenty of room for improvement in reducing the causes by which the costly and important winding ropes so soon wear out and fail.

Other particulars—

All the winding is rather slow, the engines being geared or working on second motion; and there appeared to be a brake on every winding drum. There were a few of Messrs. King and Humble's patent safety detaching hooks in use to prevent damage and injury if the enginemen overwind the skip at the top of the shaft. These are very good appliances where they are applicable; but I am not sure that they are applicable to shafts that are partly vertical and partly inclined, or that vary much in inclination requiring pulleys on

which the rope bears very tightly; for then the safety hook is liable to break the pulleys, and to get broken itself, or to get such a blow at the wings as to detach the rope from the skip in the shaft. If this happened it would be as bad as an overwind.

Other ropes—

Both steel wire and Manilla hemp ropes were used for winding up prospecting shafts, and winzes, and for capstan ropes for lifting the various heavy parts, pumps, etc.

Boilers—

The boilers appeared to be properly fitted, and to have all the necessary boiler fittings, and to be regularly inspected and cleaned.

System of lighting—

Candles were alone used for giving the necessary light in the mines underground. Kerosine oil lamps were used to give the required light where work had to be done at night on the surface. The work at these mines goes on continuously during both day and night.

The system of lighting with candles belowground is a very expensive one, but it is probably the most convenient in many ways for such mines as these, and they certainly give off much less fumes and smoke than kerosine oil lamps.

It would be very difficult to work with kerosine oil lamps in some of the confined stopes; and they would not be near so convenient as candles either when working in the stopes, or when travelling up and down the shafts; and any kind of lamp would not be as safe as candles.

Explosives—

The question of explosives is of such great and general importance at most mines, and one that so much affects the safety of the employés, that it appears to be necessary to give full details. Although what immediately follows has special reference to the Kolar Gold Mines, it contains precautions and instructions that should be followed wherever explosives are used, especially of the kind here alluded to.

Blasting—

All the country rock as well as the quartz is so hard and compact that all the rock requiring to be loosened, in every part of every mine, has to be loosened by blasting. This makes it necessary to have a very large number of explosions, and to use an enormous amount of explosives every day. The explosives used are No. 1 Dynamite, No. 1 Blasting gelatine, Gelignite, safety fuze, and triple and sextuple detonators.

The dynamite cartridges are $3\frac{1}{2}$ inches long and one inch diameter. The cartridges of blasting gelatine are of the same length, but only $\frac{7}{8}$th of an inch diameter. They are made up in paper packets tied with thin string, each packet containing about 40 to 45 cartridges, and weighing 5lbs. They are given out to the workmen in these paper packets.

Each 5lb-packet of explosive has a printed paper enclosed, giving the following caution and instructions in English, Welsh, and Gaelic; apparently of little use to the native workmen:—

**Caution to users of Nitro-glycerine explosives.**

It is highly dangerous to place nitro-glycerine explosives on or near fires, stoves, steam pipes, or any highly heated metal. These explosives must

never be put into warm water to thaw or soften.

They ought always to be put first into a water-tight vessel, and then that vessel should be placed in the warm water.

The cartridges, when frozen, may be softened without danger in warming pans, such as the company supply for the purpose.

These explosives should never be exposed to the direct rays of a tropical sun. Frozen or unfrozen they should always be handled with care.

It is safer and better to use cartridges of an easy diameter for the bore-hole, neither loose nor tight. Never attempt to put a doubled up cartridge or two cartridges abreast, into the bore-hole, but only one at a time, and squeeze each home gently before putting in the next.

*In the event of a miss-fire never attempt to draw the tamping.*—If water tamping has been used, put a fresh cartridge and detonator into the hole on the top of the charge. The explosion of the top cartridge will set off the whole charge.

If other than water tamping has been used, make a fresh bore-hole; but care must be taken to make it *at a safe distance from the former hole*, and in such a position or direction that the boring-tool cannot come into contact with explosive in, or escaping from, the whole that has missed fire.

In all cases *after a blast* the material brought down, or blown out, ought to be carefully examined, lest any cartridges, or pieces of cartridges, should remain *unexploded*.

*Gelatine explosives.*—Gelatine being stronger than dynamite, is highly recommended, especially for wet work, where dynamite would be affected by water. Gelatine dynamite is about one-third stronger than dynamite, and a very superior explosive for heavier work and wet places.

Blasting Gelatine, No. 1, is fully half as strong again as dynamite, and is the highest practical working explosive known; also quite unaffected by water.

*Detonators.*—Gelatine explosives, being less sensible to shock than dynamite require a more powerful detonator. Patent Gelatine Detonators are especially supplied for these.

**Instructions for charging bore-holes with Nitro-glycerine explosives.**

1. A *wooden rod* or *squeezer* should be used to push home the cartridges in the bore-hole. *Never use a metal rod or rammer.*
2. When charging, put only one cartridge at a time into the bore-hole, and squeeze each home gently but firmly before putting in the next. Never *ram* nor *pound* the charge home.
3. Never squeeze the cartridge containing the detonator; but lower or push it gently until it rests on the charge.
4. Use sand or clay tamping. Make sure that several inches of the tamping be loosely put on the top of the primer before beginning to stem.

Water tamping may be used for gelatines instead of the above,

Then follows, as a repetition, most of the 'Cautions' previously given.

It will be noticed that "Blasting Gelatine" is a stronger explosive than dynamite; it costs more per pound, but not for relative power; it is more inert, and requires a stronger detonator; and is, apparently, a safer all-round explosive.

Detonators—

The detonators are made up in small square tin boxes, each box holds 100 detonators packed in sawdust. Each tin box is labelled; red labels for dynamite, bearing the statement in large English type "No. 3 A," "For Dynamite only;" and blue labels for the other bearing "No. 6," "For Gelatinous Explosives" in large type. Each label also gives the following caution in English:—

"**Caution.**—These DETONATORS are much stronger than ordinary percussion caps, and should be handled with the greatest care, and kept in a dry place. The composition in them ought not to be scratched or picked with pins, knife blade, or other hard substance, as any act of this kind may cause explosion."

It would be well if the native workmen were instructed in the foregoing cautions and instructions.

The very high importance of this question of explosives is partly shown by the following table of accidents, as well as by the number of shots fired per month, and the amount of explosives used at each mine. The number of shots fired, and the amount of explosives used is very great.

## Accidents by explosives to end of October—

During 1891 there were 9 persons killed by explosives.
" 1892 " " 12 " " " "
" 1893 " " 12 " " " "
" 1894 " " 12 " " " "

or 45 in the 3 years and 10 months ending October 1894.

I believe it would greatly conduce to safety if only one kind of explosive—Blasting gelatine—and only one strength of detonators—the sextuple—were used throughout; and that by this arrangement there would be less confusion, a less number of shots failing to explode,—miss-fires,—a less number of charges only partly exploded, and very probably less noxious fumes on the whole.

## Supply of explosives—

Almost the whole of the explosives used at these mines is supplied by the Nobel's Explosives Company, Limited, Glasgow, England. If the directions given in the company's catalogue were properly carried out, there would be fewer accidents from explosives. But the directions and instructions are not properly carried out; for example, instead of squeezing the cap or detonator to the fuze by means of a proper pair of nippers, a number of which I found had been provided, see fig. 1, page 11, of the Company's Catalogue, it is a very common practice to put the detonator partly into the mouth and bite it between the teeth.

*Nobel's Explosives.*—Owing to the somewhat frequent accidents caused by explosives, the variety of practices, both in the ordinary use of explosives, and the treatment of miss-fires, and the differences of opinion among the officials as to what is best and safest to do, I submitted a series of questions to Mr. John Harris, the travelling agent in India for Messrs. Nobel and Company, on the kinds and quantities of explosives used, with some particulars of their properties; the causes of, and best modes of treating miss-fired shots; and the cause of a part of the shot hole being left unblasted, called a socket, often with a small portion of unexploded explosive in it which has been a frequent cause of accidents. I set out the questions and the answers, along with some remarks of my own, in the following form, and allowed the Mining Superintendents to see them.

## Questions and answers on explosives

I give these particulars as follows, just in the form that they were sent to the Superintendents to see,

To the Mining Superintendents of the Kolar Gold Field *to see*, and to copy, if desired.

I recently submitted the following questions to Mr. John Harris, Agent to Messrs. Nobel & Co., and he very kindly sent me the following important answers. I have added some remarks :—

| No | Questions. | Answers. | Inspector's Remarks. |
|---|---|---|---|
| 1. | What is the quantity of explosives used here per month or year, proportion of each kind, and number of detonators? | 1. The quantity of explosives supplied by this Company to the Kolar Gold Mines in 1893 was as follows :—<br>lbs.<br>Dynamite . . 117,550<br>Blasting gelatine . 268,450<br>Gelignite . . 7,650<br>Number of detonators, 834,000.<br>Coils of safety fuze (24 feet to a coil), 87,472.<br>Consumption of dynamite is decreasing, and that of blasting gelatine increasing. Our deliveries to the mines for a month's consumption during the month of August 1894 were as follows :—<br>lbs.<br>Dynamite . . 5,450<br>Blasting gelatine . 42,765<br>Gelignite . . 1,100<br>Number of detonators, 90,500.<br>Coils of safety fuze, 10,100. | Allowing about 37 inches of fuze for each shot, as the average length, then the fuze works out into about the same number of shots as the detonators. |
| 2. | What are the full names of all the explosives used here; are they No. 1 or No. 2 dynamite, No. 1 or No. 2 blasting gelatine? | 2. The names of the explosives supplied by Nobel's Company to the mines on the Kolar Gold Field are as follows :—<br>No. 1 dynamite.<br>„ 1 blasting gelatine and gelignite. | *Composition.—Dynamite No. 1* consisting of not more than 75 parts by weight of thoroughly purified nitro-glycerine, uniformly mixed with 25 parts by weight of (*a*) an infusorial earth, known as "Kieselguhr," or (*b*) a non-explosive mixture of Kieselguhr with such other ingredients and in such proportions as may, for the time being, be sanctioned by the Secretary of State, *e.g.*— |
| 3. | What effect has a moderately high temperature on these explosives and substances? | 3. All our explosives will bear the heat of the tropics, in proper magazines, for several years before starting to decompose. | Carbonate of sodium, Sulphate of barium, Mica, Talc, Ochre — Eight parts by weight (or less) in substitution for an amount by weight of Kieselguhr. |
| 4. | Which are they that exude a liquid or other substance, and what is the substance exuded? | 4. Dynamite when in contact with water precipitates its nitro-glycerine. | *Provided*—(1) That the said (*a*) Keiselguhr, or (*b*) non-explosive mixture, shall be sufficiently absorbent in quality when mixed in the above proportions to prevent exudation of nitro-glycerine, and (2) that there may be added to the Keiselguhr or non-explosive mixture an amount of carbonate of ammonium not exceeding 1½ parts by weight in every 100 parts by weight of the finished dynamite. |
| 5. | Do the gelatine explosives exude at all either by moderate heat or contact with water? | 5. Our gelatine explosives will not exude at all either by moderate heat or contact with water; I mean the atmospheric heat of India.<br>No. 1 Blasting gelatine has been kept in water for seven years with a loss of only 5 per cent. of nitro-glycerine.<br>For several years we have been permitted, if we choose to, to pack our gelatinous explosives without waterproof linings to the boxes; this permission was granted under an order in Council of a Secretary of State. | *Blasting Gelatine No. 1*, consisting of nitro-cellulose with thoroughly purified nitro-glycerine in such proportions that the whole shall be of such character and consistency as not to be liable to liquifaction or exudation, and with or without carbonate of calcium or carbonate of magnesium not exceeding one part by weight in every 100 parts by weight of the finished explosive.<br>*Primers for gelatines*, consisting of not more than 60 parts by weight of thoroughly purified nitro-glycerine, uniformly mixed with 40 parts by weight of a preparation of thoroughly purified gun-cotton and carbonate of magnesium, the whole to be of such character and consistency as not to be liable to liquifaction or exudation. |

| No. | Questions. | Answers. | Inspector's remarks. |
|---|---|---|---|
| 6. | Is the stuff exuded highly dangerous, or what are its properties? | 6. Yes, raw nitro-glycerine is dangerous, but as it is in the bore-holes ready to fire by the time it exudes, *i.e.*, if it is a wet hole, there is no danger as it is expended in the blast. | Exudation of nitro-glycerine from miss-fired charges has been given as the cause of a number of accidents while new holes were being drilled. |
| 7. | Will a primer with a detonator fire off cartridges *with certainty*, when separated from the catridges by two feet of tamping? And would this be a safe and sure method of firing missed shots? | 7. No, certainly not. I have fired charges through one foot of tamping by a detonator and a two-ounce cartridge as a primer, but this cannot be done to a certainty always with missed shots. | Some mine captains say that this is a sure and safe method. |
| 8. | What are the probable causes of shots missing fire, and what do you think is the safest means of treating miss-fired shots? | 8. The causes of shots missing fire are numerous, such as faulty or damaged fuze—the saw-dust not being all shaken out of the detonator before the fuze is inserted—injury to fuze by being knitted or doubled in the bore-hole and damaged by the ramrod, etc., etc. But generally I should opine owing to the detonator not being properly pinched on to the fuze, and also the detonator and fuze not being firmly fastened by string to the primer, thus allowing the fuze and detonator to be withdrawn from the primer during the act of tamping. Also by not properly squeezing each cartridge well home on the other, and thereby leaving an air space between the cartridges; these spaces, if filled with water tamping, intensify the difficulty of detonation being properly carried through the mass of the charge. | "Knitted" and damaged fuze may also cause a shot to "hang fire."<br><br>They should always be firmly fastened by string.<br><br>This also partly answers questions 7. |
| | | The *safest* way of treating miss-fired shots is to bore another hole parallel to the miss-fired one, about a foot away, and fire it.<br><br>It is always dangerous to tamper with the tamping of a missed fire shot hole, unless the tamping is water, in which case a new primer, detonator and fuze put on top of the charge is all that is necessary to fire it.<br><br>The cause of miss-fires with gelatine compounds I believe to be more often from using treble detonators instead of sextuple detonators than from any other cause, except perhaps in not properly compacting the charge in the hole. | The persons boring this new hole should have full knowledge of the miss-fired one, and position of its charge. And when the second charge does not fire the first also, the first and unexploded charge still remains somewhere unexploded, and is a great danger until recovered. All missed fired shots are a source of great danger, and every effort should be made to avoid them. It appears that it would simplify the use of explosives, and greatly increase the safety if, in these mines, only *one* kind of explosive, and only *one* strength of detonators were adopted for use. |
| 9. | Would it be preferable with a view to avoiding missed shots and explosives being left in "sockets," if sextuple detonators were used in all cases; if not, when should treble and when sextuple detonators be used? | 9. I have always estimated that detonators used for exploding all our gelatinous explosives, to explode them properly and with certainty, should not be of less strength than a sextuple (these contain 1 gramme of fulminate in each).<br><br>Treble detonators will always properly explode unfrozen No. 1 dynamite. | The inertness of the gelatine explosives is probably a great point in their favour when viewed from the point of view of safety in handling, conveyance, storage, ramming of the shot and almost everything up to the time of actual firing; then, to fire, they require an extra powerful detonator. A detonator is of itself an explosive of great power and danger if not dealt with cautiously, with care, and a knowledge of its nature. |

| No. | Questions. | Answers. | Inspector's remarks. |
|---|---|---|---|
| 10. | It appears that the explosives leave a "socket" or part of the hole not blown away; can this be avoided?<br><br>Is some of the unexploded charge likely to be left in such sockets, and would this portion explode if struck by a drill? | 10. No, the socket at the end of the hole cannot be always avoided; a heavy charge is the best remedy. Nothing of the explosive is likely to be left in the socket, if a proper detonator has been used, or unless the dynamite is frozen. If an unexploded charge in a bore-hole is struck by a drill, especially a percussion machine drill, you may reckon that it is fairly certain to explode. | The principal cause of the rock not being blown away to the bottom of the bore-hole, thus leaving a portion of the hole intact as a "socket," appears to be that they are drilled in such positions as to be cannons that no amount of explosives to be got into them can burst. The machine drilled holes appear to be the great offenders in this respect, because the holes are drilled more easily, but cannot be so well planted as with hand-drilled holes. |
| 11. | Is the vibration set up by a machine drill in the rock when drilling near to an unexploded charge sufficient to explode a detonator, and by it the charge of explosive? | 11. No, a new bore-hole can safely be drilled alongside a bore-hole with an unexploded charge in it, if it does not come so near as to touch the charge, but the best plan is not to drill nearer than 9 inches or 1 foot to it. | Shot holes should not be directed so much into the "fast," nor drilled too deep in that direction, and then there would be fewer sockets left.<br><br>"Cartridges of gelatine-dynamite, gelignite-dynamite, and blasting gelatine become congealed during cold weather even at a temperature so high as 45° F., and this may occur without altering the soft and plastic outward appearance of the cartridge."<br><br>"With reference to the answer to question 7, I do not agree with Mr. Harris. I have fired and seen fired thousands of missed fired charges in this way, and never knew one to fail." M. SCANTLEBURY. |

By whom shots are charged and lighted.—

Shots are charged and lighted by native contractors; maistris; foremen (this is not the official immediately under the captain); native blasters or other persons in charge of men, or shifts, or work. In some cases there is a native blaster appointed for the purpose of blasting for the natives; the Italian and English workmen do the blasting themselves. In one case the person who has to do the blasting for his own working-place is called "the miner in charge."

Inspections—

The person who charges and lights the shots is in all cases the person who is supposed to go to the place first after firing and to examine it, and the roof and sides, and give instructions as to its safety. This cannot be properly done until most of the explosive fumes are cleared out by the ventilating air; and it is an important part of the work that is probably not always done as well as it should be. Several accidents have happened soon after shot-firing, by falls of ground, that appeared to indicate the hasty manner in which the inspection was made, and the want of proper precautions having been taken.

Tamping and ignition of shots—

Wooden stemmers were supplied for tamping rods, and water, paper, and clay for tamping. These are very good if properly used, and are probably the best things, but if not properly used, the charge can readily be prematurely exploded even by them.

The various matters connected with the use, storage, and stealing of explosives, and the accidents caused by them, came before me so often that I drew up the following *suggestions*, and asked the Mine Officials to give me their opinions thereon.

| | Suggestions as to explosives. | Opinions and remarks of Mine Superintendents. |
|---|---|---|
| Storage | 1. Explosives not to be kept *in* the mine, except in properly appointed places, and *only* in secure cases or canisters of a prescribed construction. | "Approved."<br>"The explosives are regularly kept in a specially constructed magazine, and only in such boxes as they are received from the Explosives Company." |
| Detonators | 2. Explosives and detonators *not* to be kept in the same case, but to have a separate case for each. | "Approved."<br>"Detonators have always been stored in a separate building." |
| Fuze | 3. Also with a view to minimizing miss-fires, the fuze to be always kept in the case or canister. | "Approved."<br>"Before being given out to the men the safety fuze, besides being kept in a dry and well-built house, is also stored in tin lined barrels."<br>"I infer the fuze will be kept in the canister to keep it as dry as possible." |
| Carriage | 4. All explosive substances to be only given out from magazine, and carried in the locked cases or canisters. These cases should be of suitable construction for sending in cage, skip, or bucket. (A cheque bearing the Contractor's or Chargeman's name or number could be fastened to the case by the same lock as the lid.) | "Approved."<br>"The suggestion of a locked case is a good one, but to enforce its being fully carried out is another matter. I will, however, give it a trial." |
| | 5. No explosive to be carried down or up the shaft; it must all be conveyed into and out of the mine in the cage, skip, or bucket, and in the locked cases. But the detonators not to be sent or conveyed in the same cage, skip, or bucket as the other explosive substances. | "Approved." "This is being dealt with in the Mining Board Rules." "This might lead to great danger if the skip broke loose."<br>"I should suggest that no explosive should be taken out of the mine, unless to be returned after the completion of a contract, or dismissal of a contractor."<br>"Detonators should be conveyed on the person of the contractor or his representative, in preference to sending them in cage, skip, or bucket."<br>"Sending down all explosives in skips, buckets, etc., in a canister or case is, in my opinion, the proper and most safe way."<br>"I would suggest that, while the explosive itself should be sent down the mine in cases suited to skip transit, this should not apply to detonators. That detonators may be carried in suitable cases on the person; and that they be stored at surface only. And that fuzes be cut and attached to detonators, *but not to cartridges*, at surface only." |
| Use | 6. No iron or steel tool, or implement to be used in stemming. | "Approved." "Is being dealt with in Mining Board Rules." |
| Unramming | 7. A charge, after having been put to the bottom of the shot-hole or stemmed, must never be withdrawn from the hole; and no stemming material may ever be withdrawn. | "Approved." "Is being dealt with in Mining Board Rules."<br>"The stemming used here (Oorgaum Mine) is not rammed, but consists of the clay used for holding candles. Water is also used; and the paper case is sometimes pushed in the hole on top of the charge. The stemming could be scooped out with the finger, and personally I would not have the slightest fear in removing it. I have never yet heard of an accident at this mine that was attributed to removal of stemming." |

| | Suggestions as to explosives. | Opinions and remarks of Mine Superintendents. |
|---|---|---|
| Miss-fires . | 8. In case of a miss-fire, no part of a new hole to be drilled nearer to the miss-fired charge than one foot from any part of it; and any hole drilled while there is an unexploded charge in the same face of work shall only be drilled under the supervision of the person who charged the unexploded shot, he being the most likely person to know the exact position of the charge. | "Being dealt with in Mining Board Rules."<br>"I am not convinced as to the wisdom of boring a hole at a distance, say, of not less than nine inches, from an unexploded charge. I, personally speaking, would resign my place if I was at work underground, and was ordered to drill such a hole. Nearly all our blasting accidents arise from boring in the vicinity of charged holes, or commencing a hole in a "socket." I know this procedure in miss-fires is the rule under the English Acts, and will no doubt be carried out, but at the same time, I don't intend practising it *personally*. A miss-fire hole can easily be fired through at least one foot of stemming."<br>"In the case of miss-fires, if the stemming is of clay—after the fuze has been carefully withdrawn with detonator attached—sufficient stemming may be removed to ensure the explosion of the contained cartridges by the firing of an additional charge on the top of the original charge. No drilling to be attempted so long as any charge, or portion of a charge, remains unexploded. And such unexploded charges must always be exploded in the manner already described before any further work is done in any place where a miss-fire has occurred."<br>"There being other sufficient means of explosion, I prefer to disallow *any* drilling in an end while the end contains explosives. After the machine has drilled the *one* hole spoken of, there is great temptation (the machine being fixed) to bore over the end, and one of these subsequent holes may inadvertently enter the unexploded charge." |
| Time to wait after firing. | 9. After one or more shots have been fired, no person must go to the place within 10 minutes from the time the last shot exploded, or such longer time as may be necessary for the place to become clear of fumes. | "Approved."<br>"Is being dealt with in the Mining Board Rules." |
| Number of shots to be fired at one time. | 10. Not more than five shots to be charged in any one place at any one time. And all the charged shots must be lighted at the one operation, no shots to be lighted without all the charged shots in the same working face being lighted. | "Approved." "Is being dealt with in the Mining Board Rules."<br>"When shots are fired by electricity (or electric apparatus) any number of holes may be charged and fired simultaneously, but only the holes which are to be so exploded are to be charged in anticipation. No charged holes must be omitted from the circuit when the shots are fired." |
| Miss-fires, and danger signals. | 11. If there is reason to suppose that any shot has failed to explode, after having been lighted, no person must go near to the working face within an hour from the time the shot was lighted; and to prevent persons inadvertently doing so, the entrance to the place must either be fenced across the whole width of the entrance, or some person must remain at the entrance to give any necessary warning. A miss-fire signal should be put in some conspicuous place if the place of miss-fire is being left, as at the end of a shift; or those likely to go to the place should be warned, or both. | "Approved"<br>"Being dealt with in the Mining Board Rules."<br>"Might be simplified by saying that some person *must* remain at each point of access for at least one hour." |
| Examination after firing. | 12. After any shot has been fired, a person who is ordinarily in charge of shot-firing must be the first to go to the place, and he must examine it for everything affecting its safety before anyone else is allowed to go there, and give instructions as to its safety. | "Approved."<br>"Being dealt with in Mining Board Rules."<br>"Prefer to allow the maistri of the incoming shift to accompany blaster in his examination of the end." |

| | Suggestions as to explosives. | Opinion and remarks of Mine Superintendents. |
|---|---|---|
| Person in charge of shot-firing. | 13. A responsible person, who can speak the language of the natives, should be in charge of the shot-firing shifts, and be held responsible for the explosives being used only in accordance with the rules, or the directions of the Superintendent, or the Mine Captain, in conformity with the rules.<br><br>It would be well if a similar person could decide on the position and direction of all shot-holes. | "Approved." "Being dealt with in the Mining Board Rules."<br><br>"If the 'responsible person' means an European (and who else is trustworthy?), and each shift of each blasting gang requires such supervision, the cost of mining will be increased enormously. As to such person also deciding on position and directions of each hole, his directions would not be carried out unless he stood by and enforced it. This inattention to instructions given is one of the greatest troubles we have to contend with in native labour." |
| Drilling into sockets. | 14. As to drilling into sockets left by shots. What should be done as to this? | "Being dealt with in Mining Board Rules."<br><br>"No drilling should be allowed on any account in sockets left by shots." "Sockets containing any portion of an unexploded charge should be exploded, as in the case of a miss-fire, before any drilling is resumed. Should the sockets be free from explosives, drilling may be proceeded with."<br>"I do not see any objections to all the foregoing suggestions being carried out." |

The following are rules that the officials try to enforce at the Nundydroog Mine; also rules for the Mysore Reefs, and the South-East Mysore Mines, respectively. The rules were posted up at the several mines.

## "THE NUNDYDROOG COMPANY, LIMITED."

### "OORGAUM, SOUTH INDIA."

"*Rules to be observed by miners, European or Native, in the employ of the above Company, for the prevention of accidents from Dynamite, etc.*

Rules as to explosives.—

1. *Under no circumstances are men to start drilling in old holes.*
2. Should a hole have missed, it must be blasted before the men commence to drill again. Should the blaster not have notified the foreman of the shift, or of a contract, or fails to tell his maistri of the hole having missed, he has to be reported to the European in charge, or to the Captain.
3. Not more than five holes shall be charged and blasted in an end, shaft, or stope, or any one place at one time. If these blast properly, a further quantity can be charged and blasted till all the holes have gone off.
4. If the collar of a hole is blown off, and consequently some of the explosives have been scattered about the place, the blaster and his assistants must search for any unexploded cartridges.
5. Wooden rammers only to be used.
6. Dynamite or gelatine is never to be scraped or picked out of a hole; the hole must invariably be blasted.
7. Any defect in the blasting material to be reported immediately to the Captain.
8. As neglect of these rules may, and frequently do, lead to fatal accidents, it is hoped that the Europeans working underground will not only carry out the rules themselves legally, but if they notice any infraction of them on the part of the coolies, or others, they will report it immediately.

## THE MYSORE REEFS COMPANY, LIMITED,

### AND AT THE SOUTH-EAST MYSORE MINE.

*Rules regarding the use and storage of explosives.*

| | | Amount of fine. |
|---|---|---|
| 1 | No contractor will be allowed to receive in one day more than 50 lbs of dynamite or blasting gelatine, 100 detonators, and 10 coils of safety fuze. | |
| 2 | A box is supplied to each company of men to store dynamite and gelatine dynamite underground. Also a smaller box for the storage of detonators and safety fuze. Should detonators and dynamite or gelatine be found by the Agents or Foremen in the same box, a fine will be imposed of rupees ten. | R 10 |
| 3 | The contractor or men in charge of shifts of men must carefully examine their respective places of working after blasting, in order to ascertain that all the holes charged and fired have exploded before work is again resumed. In the event of the Agents, or Foremen, finding a missed hole or holes charged with explosives or dynamite or gelatine cartridges in the working, the contractors will pay a fine of rupees ten. | R 10 |
| 4 | No man is allowed to go to his working, in less time than ten minutes after an explosion. The contractor or man in charge of the shift of men to enter the working first, in order to see whether all the holes fired have exploded. | |
| 5 | No cooly or ordinary labourer to charge or fire holes, all capping or fixing of detonators on fuze to be done by the contractor or man in charge of the shift. | |
| 6 | Each company of men are supplied, on application, from the Company's store with a padlock and two keys for their respective boxes; any one losing his keys, or the locks being damaged, are particularly requested to apply at once for another lock and key; should their boxes be found by the Agents or Foremen without locks and not properly secured, a fine of rupees ten will be imposed. | R 10 |
| 7 | A leather bag is supplied to every company of men to take the dynamite or blasting gelatine from the store box underground to the working. Any person carrying dynamite or blasting gelatine about his person will be fined rupees ten. | R 10 |
| 8 | The explosives, candles, tools, etc., served out to contractors from the Company's store, are solely to be used in his working or contract whilst employed by the Mysore Reefs Company. | |
| | Any contractor or cooly with explosives, candles, or tools concealed on his person when leaving the mine or in his house, or place of abode, will be handed over to the police and prosecuted for theft. | |

*Mysore Reefs Company, Limited,*
*January 15th, 1890.*

M. SCANTLEBURY,
*Agent.*

Accidents—

A bad accident happened in March of this year at the Oorgaum mine by which 16 men lost their lives from the explosion and fumes of explosives that were being kept in a box belowground, and had become prematurely ignited. And a somewhat similar accident happened earlier in the year at the Mysore mine, but with much less disastrous effects.

Accidents from the use and abuse of explosives, in one way and another, may be said to be of frequent occurrence at these mines; but taking everything together it would not be a matter for wonder if there were even more accidents. Some of the natives and Italians appear to be clever and expert in the use of explosives;

others are clever but careless in the use and handling of explosives, and appear to forget that it is made to explode, except when they use it to loosen rock or to produce a pyrotechnic effect.

Stealing explosives—

They steal explosives from the mine, and take it home clandestinely; and use it in the mine when lighting shots as if it was an ordinary simple lighting combustible; and the use of it in the villages for fire-works displays after dark is a very common thing indeed. The special attraction for explosives is so great that they manage to get to it and steal, though almost every precaution and device is adopted to prevent them doing so. The principal magazines are strongly built of stone and mortar, with strong roof and securely fastened doors. In some the explosive is kept in a secure steel safe. Watchmen are employed to be on the look-out during the dark hours, and a tell-tale watchman's clock is kept at one magazine: but they seem to delight in pulling down one side of the magazine, carrying away the safe and its contents; and eluding the watchman with his tell-tale clock, as well as the police who are supposed to be on duty.

Accidents, etc.—

Security of strata—

*Security of roof and sides, etc.*—The securing of the strata, timbering, etc., appears to be all done by "timbermen" appointed for the purpose, and paid by the Mining Company. The workmen do not secure their own working-places. The timbermen are generally Europeans, with a staff of assisting coolies; and work to the orders, and under the directions, of the mine captains and foremen. But in the case of at least one of the small mines, the timbering is done by native timbermen, under the directions of the underground agent. It appears that at all the mines the security of the strata is under the care of the underground agents, mine captains, and foremen; and their inspections are the principal inspections made, and in many cases almost the only inspections made with the security and safety of the roof and sides as one of the principal objects.

I found that the strata was generally sound and hard, and that where it required securing, this was properly done: there was only a few exceptions to this being the case.

Timber is principally used for supporting the strata; loose refuse rock is also used where convenient; this stows away refuse rock, fills open spaces, and steadies the ground; portions of solid rock or pillars called "arches" are also occasionally left in, as, for instance, near shafts and important winzes, junctions of levels, and in extra wide places.

It appears that the following number of persons have been killed at these mines by falls of ground:—

Number of persons killed by falls of ground—

In the year 1891 there were 5 persons killed by falls of ground.
" " 1892 " 4 " " "
" " 1893 " 10 " " "
" " 1894 to the end of October there were 6 killed.

## Provision of timber, and kinds used—

The Mining Companies provide all timber for props and all other purposes.

The various kinds of timber used include:—

Hopeaparviflora, locally called "Ooropoo" and "Ironwood."
White Cedar.
Kaserino poles.
Teak.
Benteak.
Pitch pine, for stamp frames.
Rosewood.

The "Ooropoo" is used for shaft and other permanent timbers, for beams, and for other underground work.

Teak is used for poppet heads or head gears, and for beams, etc.

Benteak is said to be a softer timber than teak, and is used for beams.

White cedar is used for planks.

Kaserino poles are used belowground for temporary props and stulls; it is said to be the most adaptable for this purpose, as well as being the cheapest timber.

Supplies of timber were kept on the surface at the mines; and timber was generally sent down the shafts periodically; and in some cases a supply was constantly kept belowground.

## Provision of stores—

All the stores used at the mines were supplied by the Mining Companies. They were supplied free, in regulated quantities, to all persons employed directly by the Company, and paid daily or monthly wages. The contractor obtained from his Company explosives, tools, candles, etc., for the use of his men; and was charged for these at fixed rates per lb, about the ordinary retail price; and he was paid, I believe, at the same rates, for all such things that he returned to the stores.

## Particulars of accidents—

The following are particulars of the number of persons *killed and seriously injured* by mining accidents at and in the mines of the Kolar Gold Field during the years 1893 and 1894, kindly furnished me by Dr. T. P. O'Donnel, the Medical Officer:—

| *Belowground.* | 1893. | 1894. |
|---|---|---|
| By falls of ground | 176 | 272 |
| In shafts, or by falling down shafts, winzes, or stopes | 17 | 27 |
| By things falling down shafts, winzes, or stopes | 44 | 28 |
| By explosives | 58 | 27 |
| By machinery | ... | ... |
| Miscellaneous causes | 193 | 136 |
| Total belowground | 488 | 490 |

| *Aboveground.* | 1893. | 1894. |
|---|---|---|
| By machinery | 29 | 6 |
| Miscellaneous at and near the mines | 69 | 45 |
| Total aboveground | 98 | 51 |

*Remarks.*—Full particulars of how the injuries were received were not recorded in all the cases, and the numbers now given are simply approximate, so far as cause of accident is concerned.

(Sd.) T. P. O'D.

Taking the number of persons employed belowground as being 7,000, the above figures show that, for every 14·27 persons employed, there is one person either killed or seriously injured.

The following two lists show the number of persons *killed* since the end of the year 1890, some of the general causes, and a comparison with the number of persons killed in a year in the United Kingdom.

*Statement showing the number of accidental deaths caused by accidents at the Mines of the Kolar Gold Field from end of 1890 to end of October 1894.*

| Name of mine. | By explosives. | | | | By falls of ground. | | | | In shafts, or by falling down shafts or ladder-ways. | | | | Other causes. | | | | Total deaths from accidents. | | | | Name of Mine. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1891. | 1892. | 1893. | 1894. | 1891. | 1892. | 1893. | 1894. | 1891. | 1892. | 1893. | 1894. | 1891. | 1892. | 1893. | 1894. | 1891. | 1892. | 1893. | 1894. | | |
| 1. Mysore Reef Gold Mining Company, Limited. | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 3 | Mysore Reef. | |
| 2. South-East Mysore Gold Mining Company, Limited. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | South East Mysore. | |
| 3. Mysore Gold Mining Company, Limited. | 2 | 2 | 1 | ... | 2 | 1 | 3 | ... | 1 | ... | 1 | 1 | 1 | 8 | 2 | 1 | 6 | 11 | 7 | 2 | Mysore Gold Mine. | |
| 4. Champion Reef Gold Mining Company, Limited. | ... | 1 | 5* | 2† | ... | ... | ... | 3 | 1 | ... | ... | ... | 1 | 1 | ... | 1 | 2 | 2 | 5 | 6 | Champion Reef . . | * 3 were killed at one time in 1893, supposed to be stemming with an iron implement. † 2 Native Contractors killed in 1894. |
| 5. Oorgaum Gold Mining Company, Limited. | 6 | 9 | ... | 4 | ... | 1‡ | 4§ | 1 | ... | 2 | 1 | ... | 1 | 2 | ... | 1 | 7 | 14 | 5 | 6 | Oorgaum . . . | ‡ 1 Italian Miner. § Includes 1 English and 1 Eurasian Miner. |
| 6. Nundydroog Gold Mining Company, Limited | ... | ... | 5 | 2 | ... | ... | 3 | 1 | ... | ... | ... | ... | 3 | ... | 1 | ... | 3 | ... | 9 | 3 | Nundydroog. | |
| 7. Tank Block Mining Company, Limited. | ... | ... | ... | 2‖ | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 2 | 2 | Tank Block . . | ‖ 1 European and 1 Native suffocated from fumes caused by dropping a lighted candle into an iron chatti on dish containing explosives. |
| 8. Coromandel Gold Mining Company, Limited. | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ½ | 2¶ | ... | ... | 1 | 1 | ... | ... | 3 | 3 | Coromandel. | ¶ 1 Man killed by striking his head against a rope roll while riding up a shaft where riding is prohibited. |
| 9. Balaghat Mysore Gold Mining Company, Limited. | ... | ... | ... | 1 | 2 | 2 | ... | 1 | ... | ... | ... | 4 | 1 | 2 | 1 | 4 | 3 | 4 | 1 | 10 | Balaghat . . . | Several of the number died in the hospital from injuries received at the mine. |
| 10. Nine Reefs Gold Mining Company, Limited. | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 2 | 1 | Nine Reefs. | |
| 11. Mysore Reef Gold Mining Company, Limited. (Not working now.) | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | Mysore Reef. | |
| 12. South-East Mysore Gold Mining Company, Limited. (Not working now.) | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | South-East Mysore | |
| 13. Kolar (abandoned) . . | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | Kolar. | |
| 14. Gold Fields of Mysore Mining Company of India, Limited. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | Gold Fields. | |
| TOTAL . | 9 | 12 | 14 | 13 | 5 | 4 | 10 | 6 | 3 | 2 | 5 | 8 | 7 | 15 | 8 | 9 | 24 | 33 | 37 | 36 | | |

By explosives. By falls of ground. In shafts, or by falling down shafts or ladder-ways. Other causes. Total 130+ 6 by drowning on surface: some of the latter not employés.

*Deaths from accidents in and at Mines in the United Kingdom and at the Kolar Gold Field, South India.*

| Year. | Number of Persons Employed. | | | | Number of Mines. | Coal Mines. | | | | | | | | | Deaths per Million Tons of Minerals Raised. | | Average for the 10 years, 1883 to 1892. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Males. | | Females. | Total. | | Total Deaths. | | | Deaths per 1,000 Persons Employed. | | | Average Deaths for the 10 Years, 1883 to 1892. | | | Belowground and Aboveground. | | | |
| | Below-ground. | Above-ground. | Above-ground. | Below-ground and above-ground. | | Below-ground. | Above-ground. | Total. | Below-ground. | Above-ground. | Below-ground and above-ground. | Below-ground. | Above-ground. | Below-ground and above-ground | 1892. | 1893. | | |
| 1893 . . . | 549,738 | 128,545 | 4,725 | 683,008 | 3,383 | 940 | 120 | 1,060 | 1·709 | 0·900 | 1·552 | 2·009 | 0·959 | 1·806 | 5·110 | 6·043 | 5·654 | No females employed below-ground. |
| **Metalliferous Mines.** | | | | | | | | | | | | | | | | | | |
| 1893 . . . | 21,240 | 13,464 | 1,035 | 35,739 | 825 | 62 | 3 | 65 | 2·919 | 0·197 | 1·781 | 2·450 | 0·393 | 1·441 | There is no accurate account of quantity of mineral raised. | | | Do. |
| **Mines (Metalliferous) in the Kolar Gold Field, Mysore State, India.** | | | | | | | | | | | | | | | | | | |
| | Males. | Persons. | | | | | | | | | | | | | | | | |
| 1891 . . . | 5,544 | 3,494 | ... | 9,038 | ... | 24 | 1 | 25 | 4·329 | 0·289 | 2·766 | The total deaths in the 3 years and 10 months give an average per year of 2·889 deaths per 1,000 persons employed, or at the rate for 4 years of 3·813 per year. | | | | | | |
| 1892 . . . | 6,920 | 4,853 | ... | 11,773 | ... | 33 | 1 | 34 | 4·768 | 0·206 | 2·887 | | | | | | | |
| 1893 . . . | 7,417 | 6,513 | ... | 13,930 | ... | 37 | 1 | 38 | 4·988 | 0·153 | 2·727 | | | | | | | No females employed below-ground. |
| | Males. | Males. | Females. | | | | | | | | | | | | | | | |
| 1894 to end of October. | 7,006 | 4,702 | 565 | 12,273 | 11 | 36 | 3 | 39 | 5·138 | 0·569 | 3·177 | | | | | | | |

## Remarks on the foregoing tables—

The figures appear to show that the total deaths, and also the number of deaths per thousand persons employed, are increasing year by year; also, that the number of deaths per thousand persons employed is about 1¾ times the number of deaths in the metalliferous mines of the United Kingdom for the year 1893, which had an unusually high death-rate.

It will be seen from the following table of percentages of deaths from a few of the principal causes, deduced from the foregoing table on page 29, that the proportion of deaths caused by explosives has maintained a nearly constant ratio; the proportion by falls of ground appears to have declined; that from "other causes" has fluctuated; but the proportion caused "in shafts, etc.," has increased year by year since the end of 1891, the increase during the year 1894 being very decided indeed. This would appear to indicate that, as the shafts and workings are increased in depth, the proportion of accidents in shafts is increasing at a very rapid rate; and also adds force to the statements I have made in this report when dealing with ladders and shafts:—

| Years. | 1891. | 1892. | 1893. | 1894. |
|---|---|---|---|---|
| Total deaths. | 24 | 33 | 37 | 36 |
| *Causes.* | Percentage of whole. | Percentage of whole. | Percentage of whole. | Percentage of whole. |
| By explosives | 37·500 | 36·363 | 37·837 | 36·111 |
| By falls of ground | 20·833 | 12·121 | 27·002 | 16·666 |
| In shafts, or by falling down shafts and ladder-ways | 12·500 | 6·060 | 13·501 | 22·222 |
| Other causes | 29·166 | 45·454 | 21·621 | 25·000 |
| Total | 99·999 | 99·998 | 99·961 | 99·999 |

With reference to the large number of fatal accidents each year, especially when comparing them with the number at mines in the United Kingdom, matters like the following have to be constantly borne in mind:—

## Inexperience—

(1) Very many of the native workmen are new to mining; the mines have only been *extensively* worked during the last few years.

(2) The number of persons employed in the mines has been rapidly increasing, so that there must be a large number of inexperienced miners, the mining population being largely increased by inexperienced persons.

(3) The mining population is not a regular and settled one, but is partly made up of men who come to earn and

save money for a time and then return home to their families.

Inexperience—

(4) The workmen's proper names and addresses are seldom known to the officials, they trust to contractors for cooly labourers, and a large majority of the total labourers are of this class; consequently, a stranger without experience may be put to work that is unsuitable and unsafe for such a person.

Absence of rules—

(5) Very few rules in force that are designed to prevent accidents and secure discipline, and insufficient means of enforcing the observance of rules.

Diversity of languages—

(6) The workmen speak a variety of languages that are mostly unknown to the officials; therefore, intelligent directions, instructions, and advice from officials direct to workmen is limited.

Explosives—

(7) The necessity for using an extraordinarily large amount of violent explosives that can only be safely handled and used with care, and a knowledge of their nature.

The work—

(8) The dangerous nature of the work itself, especially for inexperienced persons, as considered in relation to the depths of the shafts and workings, and the method of getting into and out of the mines.

(9) It would appear that a great number of non-fatal accidents would be avoided if the body was protected by clothing, even as much as is the case with Europeans.

The foregoing may also account for many actions on the part of workmen that are too readily attributed to carelessness; and the remarks are almost equally applicable to other mines in India.

Investigation of accidents—

It appears that notices of *fatal* accidents are given to the police authorities as soon as possible after the occurrence, and an investigation is made by the police and by the Special Magistrate. An inspection of the place of accident is also sometimes made. I think there can be little doubt that it would tend to reduce the number of accidents, as well as preserve a better state of feeling amongst all concerned, if an inspection and investigation of all fatal and serious accidents was made by a competent mining official. The principal object of the inspections and investigations should be to prevent a reoccurrence, and to do this properly in the case of mining accidents requires a large mining experience, as well as adaptability, and a knowledge of the language spoken.

Ambulance apparatus, etc. First aid to the injured—

There is very little ambulance apparatus kept *at* the mines for the purpose of giving first aid to the injured; but there is an excellent hospital, with three European doctors, provided by the Mining

Companies. Still when it is remembered that the mining field is 9 miles long, and it has taken two hours to get an injured person from the mine to the hospital along the bad roads, and nearly as long in getting him out of a deep mine, an awkward procedure at the best, the necessity for ambulance apparatus and some one at the mines who knows how to use it is very apparent. The very able Medical Officer for the mines, Dr. Thos. P. O'Donnell, promised to see to some apparatus being provided at each mine; and also to give courses of instruction to Europeans on methods of using the apparatus, and other means of giving first aid. This will be very valuable, and may do much to relieve pain and save life.

## HOSPITAL NOTICE.

### "KOLAR GOLD-FIELD DISPENSARY."

Hospital Notice—

The Medical Officer attends, and medicines are dispensed, from 7 A.M. to 8-30 A.M. and from 4 P.M. to 5 P.M. Any employés of the Mining Company, who may require medical attendance or medicines, must first obtain an order from the Superintendent or other responsible officer who should be informed without delay of every case of illness or accident.

Employés are particularly requested to note the hours above-named.

All messages requiring the attendance of the Medical Officer at the patients' bungalows should reach the hospital not later than 8-30 A.M., unless in case of accident or sudden illness, when attention will be given at any hour.

*N. B.*—Only urgent cases or accidents attended on Sundays.

The Medical Officer's permission must be obtained by those wishing to see patients in the hospital.

Letters must not be addressed to individuals, but simply to the "Medical Officer, Hospital."

The Medical Officer kindly furnished me with the following particulars as to "health," water, sanitation, etc., in reply to the following questions that I asked:—

*Health, water, sanitation, etc.*

| Questions. | Medical Officer's replies. |
|---|---|
| 1. General state of health of the people in the mining district. | This, on the whole, is generally satisfactory. |
| 2. Principal diseases, and probable causes. | Fevers, dysentery, cholera, and pneumonia. The two first are of malarial origin; the third is usually introduced by Moplah coolies; and the latter the result of chills. |
| 3. As to the supply, and the quality of the drinking-water. | Drinking-water for the European employés is mostly distilled water. The coolies are supplied with well-water brought, in some cases, 3 or 4 miles in pipes. The quality is as good as can be obtained. |
| 4. As to sufficiency, etc., of dwelling accommodation. | The Europeans are all well housed in stone and tiled bungalows. So are the Eurasians, and the greater number of coolies; but a large number of the latter live in huts. Overcrowding takes place sometimes through the coolies' relatives coming to live with them. Everything is done to prevent this. |

*Health, water, sanitation, etc.—contd.*

| Questions. | Medical Officer's replies. |
|---|---|
| 5. General sanitation . . | Conservancy is attended to by Sanitary Overseers and scavengers, under a general Sanitary Inspector, who reports daily on one camp or another to the Medical Officer, who also makes periodical inspections of the different camps. |
| 6. Other particulars . . | The cooly water-supply is, in some instances, derived from deep shafts put down originally for mining purposes, but afterwards abandoned. The water is of good quality, but is improved by boiling.<br>The night-soil and refuse is carted to a distance, and is either incinerated or burned on the surface, or given to the ryots to manure their land. There are four incinerators on the camps. |

THOS. P. O'DONNELL,
*Chief Medical Officer, Kolar Gold-field.*

Sanitation—

I visited several of the mining camps, and was also shown round some of them and some of the adjacent villages by the Chief Sanitary Inspector. I found that the mining camps were kept cleaner than the other villages, and that the provisions for sanitation, and healthy houses and surroundings were better; there being more restrictions as to positions and relative positions of the houses, and where and how refuse, etc., should be deposited. There also appeared to be a much larger proportional number of scavengers and sweepers. The Mysore Gold Mining Company alone employs 81 persons for sanitation purposes, at a cost of ₹900 per month.

An effort is also made belowground to keep the mines sanitarily clean, by scavengers, and by providing latrines belowground at some of the mines. Clean drinking-water is also provided belowground to a small extent. But there is much room for improvement in these respects, so far as applies to the underground workings.

The following are a few general particulars, useful for reference, relating to these mines, the work-people, and their families:—

1. Provisions for persons injured and their families—

There is a good, commodious, and well-equipped hospital that the sick or injured can go to, which is under the immediate supervision and charge of Dr. Thomas P. O'Donnell, and two other properly qualified European Doctors, with a staff of Native Assistants; and is maintained by the several Gold Mining Companies. The European in-patients pay a nominal charge of ₹1 per day; but the natives get accommodation, attendance, and food free. And though there were no stipulated rules or regular and definite system of giving relief, or special funds for the purpose, much is done in this respect. Some mines give full pay to the injured man or his family until death or recovery. Others allow their native workmen half-pay while in hospital, and full pay after discharge, if he returns to work at the same mine. Others pay varying amounts up to ₹5 monthly; but all these payments are at the discretion of the Mine Superintendents: the funds from which this money is taken is made up from fines, rents of huts, etc. Light employment is also found for the disabled if they are able to do some work.

2. Scope for a sick and accident society and fund—

There is plenty of scope here, and the conditions appear to be favourable, for a good sick and accident society and fund. This would take away the charitable appearance and uncertainty of what they may receive; they would then be sure of receiving fixed and known sums that they would be entitled to receive.

3. Provisions for the sick—

The sick work-people may go to the hospital as in the case of injury, and the same rules apply, the natives being provided with accommodation, attendance, food, etc., free; the Europeans being charged a small sum for these benefits, their wages being much larger and more continuous than the natives. There is also a dispensary and hospital in charge of a passed Hospital Assistant and maintained by Government, and principally patronized by the non-European employés, and by Government servants.

The same allowances, etc., are also given in most *bonâ-fide* cases of sickness, as for accidents, but there are no funds or fixed allowances; and no such thing as a Provident Club exists amongst the employés.

4. Provisions for old age—

None. But I could not hear that any necessitous case had arisen; and there is apparently nothing done for those who are incapable of working from old age.

5. Provisions for widows—

There is no real provision, but generally a bonus or lump sum is given at time of husband's death in cases of fatal accidents at the mines. This is given, and may vary in amount at the discretion of the Mine Superintendent; the amount may be as low as ₹5, and as high as ₹50, but it appears that the sum generally given is about ₹20. Occasionally, the widows get a periodical money allowance for their support; but, as a rule, they either get employment or live with relatives.

6. Provisions for orphans—

No real or fixed provision; but whatever provision is made in cases of fatal accidents applies substantially to orphans as for widows. They are generally taken in by relatives; and if it is desired, the young children are placed in an Orphanage at Bangalore.

7. Kinds of houses provided for employés—

Some of the sizes of houses are 8′ square, 6′×9′, 9′×11′, 9′×12′, and 9′×18′. Some have one room, and others have two rooms. Some natives build their own huts, but they are mostly built by the Companies, or the materials provided by them. Their construction includes granite stone walls with tiled roof, for Europeans; tatti huts with corrugated iron roof; mud walls and thatched roof; a wood frame lined with bamboo matting, and galvanized corrugated iron roof; and mud walls with grass roofing. Sacking, or gunny bag cloth, also often enters into the composition of a dwelling. All Europeans, and Eurasians, have proper masonry houses with tiled roof. The huts or houses are arranged in various ways, but generally with a view to proper sanitation. Some are arranged in barrack fashion, in a row or line of ten huts or houses adjoining; others are square huts or blocks, four houses in one block; and others are built in long lines of detached huts, the huts being each a few feet apart to allow of sanitation.

8. Rents of houses and huts—

Some are accommodated free; but others, especially those occupying the best kinds of huts, pay a nominal rent varying from annas 1 to 8 per month, and from annas 8 to Rs. 1-8 for masonry houses.

9. Forms and positions of villages—

Several villages are adjacent to the mines: Urigam is the principal village, and has furnished the name for that locality over a good portion of the mining field, as well as for one of the mines, and is daily rising in importance. Other villages have sprung up and are still being formed on the Companies' properties for their workmen. The houses on the mining properties are laid out in straight lines as far as possible. Some are built in straight lines or streets with pairs of doors facing, a space of 20′ being supposed to be left between any two lines of houses. But the relative positions of the houses and doors vary much, some being back to back, face to face, and doors facing backs. Some are in short lines with six houses or rooms in a line, and with an open space of 60′ between each line. Others again are in detached lines of huts.

10. Sanitation above and below ground—

Latrines are built in convenient positions for the use of the natives, and are regularly attended to and cleaned. Each Mining Company employs its own staff of sweepers and scavengers to remove night-soil from both above ground and below ground, with an Overseer to superintend the work. There is also a Sanitary Inspector employed by the Companies; he acts under the immediate direction of the Chief Medical Officer, and reports to him almost daily. This officer distributes his attention throughout the mining properties and villages. The villages outside the mining properties, but in the vicinity of them are attended to by a Government Sanitary Inspector and his staff of sweepers, acting under the immediate orders of the Special Magistrate for the Gold-field. There is also a spacious and pakka shed with outhouses, built by the Government, and in a suitable position for cholera cases.

*Rules and discipline.*

11. Rules and discipline—

At six of the mines there were no written or printed rules posted up or in force.

At the Nine Reefs Mine there were short rules posted up in the changing house at Vivian's shaft, and written in Urdu, Tamil, and Kanarese, prohibiting the taking of explosives to workmen's houses.

At the Coromandel Mine there was a rule, or notice, posted up to prohibit riding in the skip.

There was a small set of rules at the Nundydroog Mine, and those referring principally to the use of explosives, and already given under that head, were posted up in English at the tops of the shafts. The other rules at this mine were the following:—

'*The Nundydroog Company, Limited, Oorgaum, South India.*"

Rules at Nundydroog Mine—

"Notice No. 1—

"Every European miner is required to pay particular attention to his air-pipes and connections, and if he find the smallest amount of air escaping, he is to immediately inform the Engineer or Captain of the matter."

"Notice No. 2—

"Any employé, European or otherwise, of the mine in possession of specimens containing gold is liable to prosecution."

"Notice No. 3—

"Contractors of this mine are considered only as maistris, and not as independent contractors; and are entitled to take two shares and no more, and give one share to coolies. The amount which they get from the office must be distributed on the spot."

"Notice No. 4—

"Contractors or any other employés of this mine must not carry any mining materials home, as candles, dynamite, fuze, detonators, jumpers, etc.; if they do so, they are liable to dismissal. Boxes are provided for them underground."

Loose ground—

"Complaints with regard to loose ground in any of the underground workings must be reported either to the European in charge, or to one of the agents."

"*Signals.*"

| | |
|---|---|
| "I.—Stop. | VI.—European coming in skip. |
| II.—Lower } for skip. | VIII.—Drive pumping engine faster. |
| III.—Haul up } for skip. | IX.—Drive pumping engine slower. |
| IV.—Lower } Captain. | X.—Start the engine. |
| V.—Haul up } Captain. | XII.—Stop the engine. |

Under no circumstance is any one to signal the skip to be raised or lowered unless he is at the spot under ground where the skip is."

"————*Superintendent.*"

There were rules posted up at the South-East Mysore, and the Mysore Reef Mines, relating to the use and storage of explosives. These rules have already been given in this report. They are printed in English and in Tamil, and are said to be read out weekly to every shift of men in their own language.

There were many understood orders and rules at all the mines; and all the Europeans work under a signed agreement that acts to some extent as rules for their guidance and conduct.

Stealing—

The matter of stealing and trespass is a very sore one, and one that is continually occurring. With all the clever tricks and devices that the natives bring to bear on this matter, they manage to steal continually and to elude all the devices and watchfulness of the officials. Almost everything is done that is thought to be possible to prevent the stealing, such as restrictions on their going in and out, fencing, searching, watchmen, notices, threats, and other things; still, a small quantity of gold is of such great value that the people do not appear to be able to resist the temptation. When a coolie can put more than the value of his day's wages into a decayed tooth, the temptation is too great for him. He purposely grows his hair a little long and distributes rich particles of gold amongst it. He hides it in a piece of candle clay; in a small hollow made in the end of his candle and re-sealed; under his tongue; and in many other ways; he also suffers internal danger by swallowing it, when other devices are likely to be detected; and he sometimes undergoes great bodily risks to avoid being searched.

## Employés, Numbers and Ages—

It will be noticed from the following table of persons employed that there are *no* females employed below ground at these mines, and only four boys under 16 years of age. Above ground, there were only 11 boys under 10 years of age regularly employed; and 28 females under 12 years, and 68 from 12 to 16 years. There were, apparently, a greater proportion of young boys and girls employed by the contractors who do irregular surface work. But here, as at all the other mining districts visited, there was no regular register kept of name, age, etc., of boys, girls, and women, and it is difficult to find out their ages.

*Persons employed at the Kolar Gold Mines, October 1894.*

| Names of Mines. | | | | | | | | | | | Descriptions of persons. | Totals. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mysore Reef. | South-East Mysore. | Mysore. | Champion Reef. | Oorgaum. | Nundydroog. | Tank. | Coromandel. | Balaghat. | Nine Reefs. | Gold-fields. | | |
| | | | | | | | | | | | UNDER GROUND. | |
| 145 | 100 | 1,499 | 1,327 | 1,440 | 1,236 | 100 | 160 | 755 | 120 | 120 | Men . . . . | 7,002 |
| ... | ... | 1 | ... | ... | ... | ... | ... | 3 | ... | ... | Boys 10 to 16 years . | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | „ under 10 years . | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Women above 16 years | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | „ 12 to 16 years | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Girls under 12 years . | ... |
| 145 | 100 | 1,500 | 1,327 | 1,440 | 1,236 | 100 | 160 | 758 | 120 | 120 | TOTAL BELOW GROUND. | 7,006 |
| | | | | | | | | | | | ABOVE GROUND. | |
| 196 | 116 | 1,251 | 655 | 925 | 594 | 118 | 135 | 231 | 82 | 80 | Men . . . . | 4,383 |
| 10 | 4 | 20 | 131 | 62 | 29 | 19 | 10 | 12 | 5 | 6 | Boys 10 to 16 years . | 308 |
| ... | ... | ... | ... | ... | 11 | ... | ... | ... | ... | ... | „ under 10 years . | 11 |
| 6 | 5 | 106 | 130 | 139 | 48 | 9 | 15 | 1 | 8 | 2 | Women above 16 years | 469 |
| 10 | 8 | ... | 15 | ... | 34 | ... | ... | 1 | ... | ... | „ 12 to 16 years . | 68 |
| 3 | 2 | ... | 13 | ... | 6 | 4 | ... | ... | ... | ... | Girls under 12 years . | 28 |
| 225 | 135 | 1,377 | 944 | 1,126 | 722 | 150 | 160 | 245 | 95 | 88 | TOTAL ABOVE GROUND. | 5,267 |
| 370 | 235 | 2,877 | 2,271 | 2,566 | 1,958 | 250 | 320 | 1,003 | 215 | 208 | TOTAL ABOVE AND BELOW GROUND. | 12,273 |
| | | | | | | | | | | | UNDER GROUND. | Ages. |
| 18 | 18 | 14 | 18 | 18 to 20 | ... | ... | ... | 15 | ... | ... | Youngest boys . . | 14 to 18 years. |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | „ girls . . | None. |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Oldest women . . | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Number of married females. | ... |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Number of unmarried females. | ... |

*Persons employed at the Kolar Gold Mines, October 1894*—contd.

| Names of Mines. | | | | | | | | | | | Descriptions of persons. | Totals. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mysore Reef. | South-East Mysore. | Mysore. | Champion Reef. | Oorgaum. | Nundydroog. | Tank. | Coromandel. | Balaghat. | Nine Reefs. | Gold-fields. | | |
| | | | | | | | | | | | ABOVE GROUND. | |
| 10 | 10 | ... | 10 | 12 | 8 | 8 | 10 | 12 | 10 | 12 | Youngest boys . . | 8 to 12 years. |
| 10 | 10 | ... | 10 | ... | 7 | 8 | 18 | 14 | ... | ... | „ girls . . | 7 to 18 years. |
| 40 | 40 | ... | 40 | 50 | 45 | 40 | 50 | ... | 40 | 40 | Oldest women . . | 40 to 50 years |
| 6 | 5 | ... | ... | ... | ... | ... | 15 | ... | 8 | 2 | Number of married females. | 36 ? |
| 13 | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | Number of unmarried females. | 23 ? |

Contractors doing irregular contract work on the surface employ large numbers of persons of both sexes, and all ages; and these are not included in the above.

## Time of employment: Underground—

All the underground work is carried on in three shifts, of eight hours each, at all the mines.

The first shift is from 7 A.M. to 3 P.M.; second shift from 3 P.M. to 11 P.M.; third shift from 11 P.M. to 7 A.M.

The mines below ground are worked, more or less, 7 days in every week; and persons may be employed 56 hours per week.

## Above ground—

The generally recognised hours of employment above ground are from 7 A.M. to 5 P.M., with one hour's interval, about noon, for meal and rest, or about nine actual working hours per day. A proportion necessarily work in the night time as the mills run continuously throughout the week. The number of days worked per week is up to 7, and the number of hours up to 63.

## Wages: Underground—

The amount of wages earned varies a good deal amongst the different classes of workmen: but I think they may be generally considered to be good. The following are a few particulars:

Europeans, from £12 to £40 per month, and more.
Native foremen, up to R35 per month.
Maistris working rock-drills, R30 per month.
Native timbermen, As. 12 to R1 per day.
Other natives, As. 8 to R1 per day.
Coolies, As. 8 per day.

## Aboveground—

Fitters, etc., As. 5 to R1 per day.
Enginemen, As. 10 to As. 12 per day.
Other native men, As. 5 to R1; and boys, As. 3 to As. 6 per day.
Coolies, As. 2 per day.
Women, As. 2 to As. 3 per day.
Children, As. 2 per day.

## Changing rooms—

The system of having changing rooms in which work-persons can

change and dry their clothes is partly carried out at some of the mines.

It is a matter affecting the health and comfort of the employés, and is enforced by the English Metalliferous Mines Act. Though these rooms are not so necessary here as is most often the case in England, they appeared to be more necessary than the provision indicated, and I think more might well be done in this direction.

## 4.—THE WARORA COLLIERY, C. P.

*Owner*—THE GOVERNMENT OF INDIA.

I began the inspection of this colliery on the 27th November 1894.

### Ventilation—

This is one of the few mines in India where a proper and systematic attempt is made to ventilate the mine in a way that should ensure a constant and adequate amount of ventilation passing through all parts of the mine.

The principal ventilating apparatus consists of a Waddle fan running at about 40 to 45 revolutions per minute. It is 30 feet diameter; and there are two steam engines for the purpose of working the fan, one engine only being used at one time. The engines are changed about monthly; and the fan is stopped as a rule for about 1½ hours every Sunday morning for the purpose of examination, cleaning, etc. There are also three boilers especially for the purpose, but only two are worked at one time. Other particulars of the ventilating system include 12 wooden air doors, the standard size of which is 6 feet × 4½ feet; and 53 brattice sheet doors. Also eight brick and timber air crossings; 299 ventilation or ordinary brick stoppings; and 63 sheet ventilating stoppings. There are boys to attend to all the wood doors.

### Persons employed—

There were 1,583 persons employed at the mine made up as follows:—

| UNDERGROUND. | NUMBER. |
|---|---|
| Sarkari men | 169 |
| Contractor's men | 689 |
| Boys of 10 to 16 years | 31 |
| TOTAL BELOWGROUND | 889 |
| ABOVE GROUND. | |
| Men | 561 |
| Boys of 10 to 16 years | 73 |
| Women above 16 years | 55 |
| „ of 12 to 16 years | 5 |
| TOTAL ABOVEGROUND | 694 |
| TOTAL ABOVE AND BELOWGROUND | 1,583 |

### Females—

Females are not employed, or allowed to go belowground at this mine.

And the youngest male belowground was supposed to be at least 12 years of age; and the youngest employé aboveground was 10 years of age.

## Employés at brick works—

In addition to the foregoing employés, there were 250 persons—135 males and 115 females—employed at an excellent and valuable brick and tile works adjacent to and connected with the mine.

## Hours of employment—

The mine is worked in three continuous shifts of eight hours each; but the employés aboveground work ten hours per shift.

## Wages—

The following are a few particulars of the wages earned by the different classes of labourers:—

| | Wages per day. R a. p. |
|---|---|
| **Underground—** | |
| Head mates from | 1 2 0 |
| Cooly labour | 0 5 0 |
| Machine drillers | 0 6 0 |
| Coal hewers | 0 5 0 |
| | to 0 6 0 |
| Coal hewers working top coal | 0 7 0 |
| Trammers, average | 0 3 0 |
| | to 0 4 0 |
| Shot men | 0 6 0 |
| Underground masons | 0 10 0 |
| Door boys | 0 2 0 |
| | to 0 3 0 |
| **Aboveground—** | |
| Men on surface | 0 4 0 |
| Boys on surface | 0 2½ 0 |
| Women on surface | 0 2½ 0 |

## At brick works—

| | |
|---|---|
| Men at brick and tile works | annas 3, 4, and 5 per day. |
| Boys | pice 7 to 10 per day. |
| Women | annas 1½ to 2 „ „ |
| Girls | pice 5 „ „ |

But it is nearly all piece work.

## Haulage—

Another thing that was almost unique in India was an excellent endless rope haulage system from the dip workings. The tubs were connected to the rope quickly and easily at any part of the incline by Rutherford and Thompson clips. The tubs travelled singly, each separate tub being clipped directly to the rope; and all the full tubs were automatically disengaged at the top of the incline. This system of haulage was working very smoothly and successfully, and appeared to be capable of being extended to almost any distance, and to economically convey a large output from the dip workings.

## Lighting—

The manager of this mine has been trying the use of an adaptation of a simple form of storm lamp with the object of being able to burn kerosine oil without the very great disadvantage of the volumes of soot and smoke that is given off when it is burned in the open lamps ordinarily used at mines in India.

## Blasting powder—

Another practice at this colliery that might be adopted with many advantages at other mines is that of regularly testing the strength of

samples of all the country blasting powder submitted for purchase. It is regularly tested in a specially constructed apparatus, and the strength required of it is that one-half drachm should raise a ball weighing 26½ lbs. for from 20 to 25 inches. "This is equivalent to ½ a drachm doing 44 to 55 foot lbs. of work."

Drinking water—

All the castes appear to take water from the hydrants. "Water from the hydrants is more largely used for drinking purposes than that from any other source." The water is pumped into the hydrants from a well called the Bordah well which is half a mile from the colliery.

Sanitation—

The general sanitation is considered to be good as regards cleanliness, conservancy, etc. There is one head sweeper and 16 other sweepers for the surface—8 males and 8 females; there are also 11 sweepers below ground. The night-soil from the public latrines, both surface and underground, is carried to the vegetable garden in a covered cart and buried there in trenches of regulated dimensions. The number of latrines on the surface were "considered to be sufficient," the number being a total of 14 latrines—7 for males and the other 7 for females. The latrines for both males and females are of the Horbury's pattern. A charge of one pie per ton is made on contractors for the purpose of defraying the cost of sanitation, and it costs 1 anna per head per month for men on the colliery pay sheets.

Weighing and Screening—

All the coal raised at this mine is weighed in the tubs as soon as it leaves the cage, and the coal is then tipped directly on to the screens along which it passes at once into the railway wagons. There is no putting down of the coal on to the floor, lifting it up again, carrying it about, and then hand screening it, that is so common at Indian mines as if they were afraid to part with it and did not want to let it go from the colliery. At this mine the coal has only been on the surface for a few seconds when it has been weighed, screened, and is landed in the railway wagons. This looks like business. The same principle prevails below ground, for I noticed that in a great many working places in the mine the coal was shoveled at once into the iron tubs, directly from the working face where the coal had been made to fall from the whole coal; and the coolies were doing this almost as well as an Englishman. The coolies were also tramming the coal along the various levels and inclines of the mine in a very clever way; two men went to each tub, and they used skotches or lockers on the inclines. All the tramming and handling of the coal below ground has to be done by men and boys because no females are employed below ground, nor any boys under 12 years of age. It was also very noticeable to me how anxious some of the hewing coolies were to work, and when the winding and tramming was stopped for some special reason, many of the hewers spent hours of work in shoveling the loose coal back out of their way, so that they might have room to work at the coal face; these men were paid for the number of feet driven without reference to the amount of coal sent out, except in so far as that was controlled by the size of the driving. During a few days when there had been no hauling in the No. 2 seam, owing to the hauling engine being under repairs, some of the hewers filled the wagon roads so full

of loose coal that it was very difficult indeed to get to where they were working; for some yards it would have been quite impossible for a big man to get over the loose coal by any means. It appears that these men come from much further north, and make good and regular workers during the term they remain at the mine. It appears that this is not at all unusual, but somewhat common for men who leave their families and go to work in the mines for periodical terms to be much better and steadier workers than those who are regular residents in the mining districts; and one would expect this to be so.

## 5.—THE MOHPANI MINES, C. P.

*Owner*—THE NERBUDDA COAL AND IRON COMPANY, LIMITED.

The inspection of these mines began on the 15th December 1894. The term mines is put in the plural because of a new section being opened at a short distance from the old workings; but as it is really an extension of the present mine being worked, it may well be looked upon as the same mine.

The system carried out in working this mine is a pretty close copy of North of England practice.

### Inspections—

An inspection of all working places and travelling roads, and any other parts likely to affect the safety of the mine, is made several times during the shifts, and once immediately before the commencement of the shift when there has been a break of work; but ordinarily the mine is worked continuously throughout every 24 hours by 3 shifts of 8 hours each. These inspections are ordinarily made, first by the mates, then the Overmen in the fore shifts, and the Deputy Overmen in the other shifts, and general inspections by the Under-viewers and Manager. The waste parts outside the regular workings are also inspected weekly by the Overmen.

### Reports—

The Mates, Overmen, and the Deputy Overmen each write a daily report at the end of their shift of work; the reports are made in books provided for the purpose, and are daily initialled by the Under-viewer. The Under-viewer also sends a daily report to the Manager. Weekly reports of the inspections of the mine wastes are also made by the Overmen. The machinery, ropes, chains, and boilers are inspected and reported on daily by the Engineer or his foreman; this is made in a book kept for the purpose in the Engineer's time office: and the weekly reports of the weekly examinations of the shafts are also recorded in the same book. All the reports are written in English, and a Munshi writes them for the Native examiners.

### System of working—

The seams of coal are known by the numbers 1, 2, 3, and 4; and vary in thickness from 3 feet to 25 feet.

The system of working out the coal is, taken altogether, quite unique for India. The mine was first cut out on the bord and pillar or pillar and stall system, and all the pillars are now being bodily worked out by a species of long wall working, that is, much after the same form as long wall working; and nearly the whole of the waste or goaf immediately behind the working faces is filled with "mati," stones and rubble, quarried on the surface and sent into the mine for packing. In

addition to the packing being kept filled in and built up to within a few feet of the working faces, each working face is thickly timbered between the coal and the pack walls, and in the bords adjacent to the working faces, but nearly all the timber is withdrawn as it is being replaced by packing. As a rule the roof breaks off near the face and settles on the packing. In all cases where possible the ingoing dirt for packing is made to haul out the coal.

The way that portions of the coal seam are worked away at one time is called working by lifts, and "the workings are now all in 'brokens' which are being worked back from the boundary by a system of horizontal lifts in ascending order, each lift being 6 to 8 feet in thickness; all the lifts and galleries are packed solid with earth and stones sent from surface, excepting the top slice in which about ⅓rd the area of that thickness is left unpacked." This part that is left open and unpacked is arranged so as to be between built up pack walls.

The nature of this work naturally divides up the employés into two general sections, namely, the coal hewers and carriers, and the mati packers and carriers; and the amount of work required to be done by each section of employés is about the same. But the very great advantages are thus secured of being able to work out almost all the coal, it keeps the cost for timber low, and the mine can be worked safely. Another great advantage gained by packing at this mine is that the packing prevents the ground sinking and breaking in such a way as to let in the surface, which if it did happen would also let in the surface water.

Ventilation—

The principal part of the workings have the ventilation produced by a Capell fan 7 feet diameter and 6 feet wide, double entry, and worked by a single engine and leather belt at about 100 revolutions per minute, the engine running at 20 to 25 revolutions per minute. Another part of the workings have natural ventilation in cold weather, and in hot weather by a furnace 6 feet × 5 feet area, and kept continually going when required.

Double winged wooden air-doors are also used, also brattice doors, and cloth and brick bratticing, and cloth and brick fast air stoppings.

Firedamp—

Firedamp was found at this mine, down No. 24 pit, new workings, on the evening of the 12th December 1894; and two miners were badly burned by it. I made an inspection of the place two days after the accident, in company with Mr. F. L. G. Simpson, the Manager, and I then found a very small quantity of explosive gas in each of two working places, in one place on each side of the shaft. The mine had newly been opened, the total length of underground driving was less than 150 yards. Only one shaft had been sunk to the seam, this being 9 feet diameter and 71½ feet deep; and was serving for both the downcast and the upcast air. The shaft was fitted with a brattice cloth partition dividing it into two unequal sections, the smallest being used exclusively for the upcast air and the steam pipe for the pulsometer. There were at the time only 3 working places, and the most distant place was within 50 yards from the shaft. The gas was lighted by two miners who were practically examining the place with naked lights at the change of shifts, these

same two men were badly burned about the face and other upper parts of the body. Naked lights were regularly used, and the officials had not previously suspected danger; but when the accident happened the mine was stopped for some time while the ventilation was improved, and safety lamps obtained. It afterwards transpired that the gas had given a little previous warning to the men, but they did not know what it meant until it made them feel. The accident was fully due to inexperience of the nature and properties of gases, especially of firedamp; and the accident might have been avoided. The two men were cured, but they nearly lost their lives. It is another of those cases that go to show, if it was not already fully established, that firedamp may make its presence felt, and may be found in what has hitherto, in India, been looked upon as very unlikely places for it: and that it should always be looked for and guarded against even in apparently unlikely places; but especially so when first striking a seam, or opening out new workings, or in any exploring or prospecting work. The quantity of explosive gas present, when I inspected on the 15th December, was very small indeed; but it is necessary to keep impressing the fact that a little of the gas goes a very long way, *i.e.*, that a very small quantity of firedamp mixed with a suitable amount of atmospheric air is capable of making a very powerful explosion and one highly destructive to life and property. Another important point in this connection is, that the ventilation of mines or parts of mines often become in such a state that a very small, and even very temporary stoppage, alteration, or check on anything connected with the ventilation is quite sufficient to provide all the conditions for an accumulation of enough firedamp to wreck the mine and kill those in it.

Blasting—

An effort is made at this colliery to carry out the safety principles of the English Mines Acts as to carrying the explosives into the mine in tin cases or canisters, and in cartridges; amount taken at one time; inspecting before and after firing; charging, stemming, stemming material, and tamping rods; and in treating missfired charges, and the persons, and places of missfire.

Timbering—

Mine carpenters fix all timbers to secure the roof and sides of the mine workings; they are directed, principally, by the native Mates and the Overmen; and they timber any place which they think requires it without instructions. The hewers do not secure their own working places, and seldom assist or give a helping hand not even to the setting of sprags to the coal in their own working places where required. The Mining Company supplies all the timber required; and a supply is kept stacked on the surface at the mine; and the sending of timber down into the mine as required is directed by the Overmen. The timbers used belowground are:—

Kaim;
Lariya;
Unjun;
Hurdoo;
Dho, said to be a very good wood;
Koha;
Tendoo (ebony tree);
Ghirva:
Goonja;
Awara, said to be good;
Karee; and
Burdha.

A good proportion of the timber used in the mine appeared to be brought from the wooded jungals on the slopes of the many hills surrounding the mine; and most of it is brought down on Sundays. It was a very interesting sight to see the men and women coming along and down the jungal paths, each carrying one, two, or three timbers in the hope of being able to sell them to the Manager, at a fixed rate per prop, for use in the mine. These people who bring down on their shoulders the weekly supply of colliery timber from the hills, are said to be the aboriginal hill tribes of the country; and they did appear to be original indeed in dress, language, and behaviour. Many of them appeared to be very strong, though not very large; and many females carried a heavy baby as well as a heavy timber: and one would judge of them as being simple in everything, superstitious, and probably honest, with just a little warrior like courage bred of the many dangers often met with and overcome.

Stores—

All other stores are provided by the Colliery Company, except that the hewers, and the coal carriers find their own lamps, picks, and tokris.

The wick used for all the small open oil lamps used in the mine is prepared for the purpose at the mine; several females find employment by sitting on the ground in front of the colliery workshop, loosely spinning the lamp wick, and winding it on a reel as made from cotton waste or from yarn.

Dispensary—

There is a dispensary right in the heart of the colliery premises. It is in charge of a 1st class native doctor, a Mohammedan, who, I believe, is a passed Army Surgeon. Though the dispensary is small, it is provided with all the most necessary medicines and surgical appliances, and has occasionally to do service as a hospital for in-patients in a small way; in fact, during the time I was at the mine, there was a male and a female in-patient, and they were properly provided for. A good deal of good work is done by this institution both to the miners and to their neighbours; and this and everything about the mine being so compact, it is most easy of access, yet it is just the smallest distance out of the ordinary way to and from the different sections of the mine, and the wants of patients can be attended to at once, and at any time.

Sanitation—

The doctor also acts as a kind of inspecting and supervising officer over the cleanliness and sanitation of the mining and other adjoining villages. Latrines have not been provided, but there are sweepers employed both in and out of the mine; the refuse is regularly collected and taken to fixed stations outside the villages, and there burned. The doctor also says that large quantities of disinfecting powder is systematically used, with a view to getting the most good from it. One can only have a good word for the results of all the efforts to promote cleanliness and health.

Wages—

The approximate wages earned by the employés are:—

Belowground.

Hewers, about 6 annas per day.
Mates, about 7 annas per day.

Datallers (labourers), 3 to 4 annas per day.
Door boys and carriers, 2 to 2½ annas per day.
Other carriers, 3 annas per day.
Carriers working on fixed wages, 2 annas per day.

Aboveground.

Men, 3 annas to R1-4 per day.
Boiler and shop boys, and carriers, 2 annas per day.
Female carriers and others doing general labouring work, from 1½ to 2 annas per day when on fixed wages; and 2 to 3 annas per day when working on contract.

Some General Particulars—

The native employés appear to be made up of Gonds, Kawnras, Googers, Pardhans, credited with being healthy, strong and well-built people; a few of the Bhurriah section of the Gond caste are said not to be so well built as the others. Then there are the Kutias, Kotwars, and Korees, who are said to be more sickly than the other workmen.

The medical officer inspects the village, bazar, the lines of houses, and other habitations every morning, principally to see that they are kept clean. There are ten flag stations just outside the villages to which the villagers and sweepers are required to take the refuse, the refuse being burned there every week in the dry weather. In the rainy season when the river is flooded the refuse is thrown into the river. The position of the mining village relatively to the river is such that good natural drainage is provided. The employés live in several villages, there being 5 villages within a radius of one mile. The regular employés at the mine appeared to be generally well dressed, it was not unusual to see men wearing shoes, dhoti, jacket, and pagri.

I believe there was no toddy shop for many miles away from the mine.

Rules—

There was a set of rules being enforced at the mine that included rules for the Mine Captain, Overmen, Mates, Carpenters, Engineer, Enginemen and Banksmen, Banksmen and Onsetters, General instructions, and shot firing rules.

Children—

No small children are employed in this mine, and none are allowed to be taken into the mine.

## 6.—UMARIA MINE, C. P.

*Owner*—THE GOVERNMENT OF INDIA.

The inspection of this mine was commenced on the 4th January 1895.

Mr. James Archibald Maughan, the late Manager of the mine, died very suddenly on the 20th December 1894, within about 4 hours of being at work below ground. He made some of the arrangements for my visit before his fatal illness and sudden death.

Inspections and reports—

Regular inspections of the different parts of the mine were being made by the mine officials; and a daily report on a printed form was made by the Deputy Overman on general matters affecting safety and the working of the mine. The Mechanic Foreman reported on the machinery; and the Underlookers noted each shift in a book kept below ground on anything they thought required notice. No

reports were made of shaft inspections, though the inspections were said to be regularly made.

All the workmen, and nearly all the officials, went into and out of the mine by way of the inclines.

System of working—

The No. 2 seam is 6 feet to 7 feet thick; and the No. 3 seam averages 7½ feet thick.

The system of working out the coal is the bord and pillar or pillar and stall system.

The coal pillars are being worked out ("work in brokens") by first driving roads through the pillars (the full height of the seam) to split up the pillars into convenient sized portions. Then the pillars are worked out in vertical slices in the same order as in the bords. The roof requires to be thickly timbered behind the working faces, but the timber is drawn out again as soon as a portion of a coal pillar has been worked out; and the roof breaks up and falls either as soon as the timber is withdrawn, or partly then and to a much greater extent when a number of pillars together have been removed. But though the timber is supposed to be withdrawn, so far as is safe, as the pillars of coal are worked out, there is a great quantity of timber irretrievably lost.

Ventilation—

The ventilation was principally provided by a Schiele fan 9½ feet diameter, and from 20 inches to 4 feet wide, and running at about 90 revolutions per minute. The fan was driven by a single condensing engine, and rope gearing. It was said to be capable of producing 75,000 cubic feet of air per minute when running at 90 revolutions per minute. The air-doors used in the mine were made by covering a wood frame with galvanised iron, and swinging this in another wood frame built in brick walls. They were opened and closed by boys, principally, but one was tended by an aged woman. Brattice doors were also used, and made by fixing two props under a cross-bar to the roof, and firmly nailing the hanging sheet to the bar, and closing the sides from the props to the coal by other nailed sheeting. Bratticing in mines where naked lights are used is always a source of great danger, unless the mine is wet or the cloth is rendered non-inflammable in some other way. I have heard of bratticing having been set on fire at several mines I have inspected. Underground fires that had very small and simple beginnings have recently caused great loss of life in England and in Wales, the fumes from the burning sheeting, timber, and coal being sufficient to prevent the workmen beyond from getting out of the mine alive. With a view to properly directing the ventilation in this mine, and made necessary by the system of working, there were a great number of the before named doors in use; also brattice in long sheets; an air-crossing; and a great number of brattice stoppings, and pakka brick stoppings set and plastered with mud.

Sanitation—

Although there were matters connected with the sanitation that were not satisfactory, especially below ground, a great effort was certainly being made to keep both the mine and the mining villages sanitarily clean. For this purpose there were provided 9 latrines on the surface, 6 of them being for males and the other 3 for females.

There were 12 male and 12 female sweepers, and 1 jemadar in the mining camp; also 7 male and 7 female sweepers, and 1 jemadar in the other two villages; in addition to 7 male sweepers and 1 jemadar for below ground, or a total of 45 sweepers and 3 jemadars employed by the mine.

Water—

The drinking water was pumped from an old shaft and supplied to the villages in stand pipes with taps attached. All the many different castes mingle together when fetching water from these pipes. Many of the workpeople are brought in from a distance, and consequently there are many strangers and a variety of castes. There is quite a large crowd of water carriers round the pipes at such times as change of shifts and meal times, and consequently just a little crush and waiting, but at other times the pipes are idle. A new well had been sunk near to the river, and was being fitted up for pumping the water to the mine and to the villages.

## 7.—SINGARENI COLLIERY, HYDERABAD (DECCAN).

*Owners.*—THE HYDERABAD (DECCAN) COMPANY, LIMITED.

*Situation of mine.*—Yellandu, 157 miles from Secunderabad; territory of His Highness the Nizam of Hyderabad (Deccan). Yellandu is the terminus of a 16 miles branch railway from Dornakal junction, the Nizam's Guaranteed State Railway.

The principal officials of this mine are—The Agent and General Manager in India; the Manager; and three assistants to the Manager. The Manager and one of his assistants have English Mine Manager's certificates.

The other officials include four Underlookers who have complete charge of the mine under the assistants to the Manager; four night Overmen; and a number of Makadams who assist the Overmen, secure the roof, fire shots, etc. The contractors also employ officials to supervise their work. The Underlookers are not Englishmen, some are Natives and the others Eurasians.

Inspections and Reports—

The mine is worked by a succession of 8 hours' shifts, but when there is a cessation of work, an inspection of the mine is made just before the commencement of the following shift. And a regular periodical inspection is made during one of the shifts in each 24 hours, in addition to numerous casual inspections. The principal inspections are made by the assistants to the Manager; and the Underlooker's inspection comes next in importance.

Each of the assistants to the Manager makes a daily report in a book kept at the surface of his own section of the mine, in which is recorded the condition of the ventilation, roof and sides, and general safety of the underground workings, and particulars of the output and work done at the mine during the previous 24 hours. This report is written each morning, and a duplicate copy is sent to the Manager. The Mechanical Engineer, or his assistant, makes a daily and a weekly written report as to the condition of the machinery, ropes, boilers, etc., and including everything pertaining to the winding shafts.

System of working—

The thickness of the seam—King seam—is from 3 feet to 7 feet; most often about 5½ feet; average about 6 feet.

The system of working out the coal is the bord and pillar or pillar and stall. The bords and levels are 12 feet wide, and the pillars are formed so as to be uniformly 18 feet × 12 feet throughout the mine. The mode of breaking down the coal is to undercut it at the bottom to about 3 feet deep, cut one side to the same depth, and then blast the coal down by at least 3 shots in a working face, each shot having a charge of 4 oz. of English blasting powder. All the coal throughout the mine requires to be loosened by blasting.

## Ventilation—

The air for the ventilation of the mine was generated by a small fan, a small furnace, and exhaust air from underground engines. Preparations were being made for the erection of a large Schiele fan for the ventilation of nearly the whole colliery. The air was being directed belowground by substantial stone stoppings formed of double walls with dirt between ; also by air crossings, wood doors, and brattice sheeting for directing the air to some of the working places.

## Blasting—

From 20,000 to 30,000 shots are fired per month, and in almost all matters appertaining to blasting the practice is very similar to the requirements of the English mining law.

## Timbering—

The roof of the seam, next above the coal, is generally of such a sound nature that not much timber is required. The timber found to be best for underground purposes is known as "Tirmani timber," and is the kind that is mostly used. A supply of timber is kept ready for use in convenient parts.

## Hospital—

The Colliery Company provides a hospital at the mine, fully equipped with medicines, beds, and a doctor with assistants. This hospital with its qualified staff serves as the dispensary and means of medical relief for all the people for many miles round as well as for those working at the mine, and a very great amount of good is done by it to hundreds of the Nizam's poor subjects who are in no way connected with the mine. For example, in 1893 there were 18,301 persons treated as out-patients, or an average of about 50 each day ; and 1,369 persons, or from 4 to 5 a day, were treated as in-patients.

In 1894 the number of persons treated as out-patients was 36,925, or over 100 each day; and 1,838 persons, or 5 each day, were treated as in-patients.

## Sanitation—

The doctor has also charge of all the sanitary arrangements aboveground. There are separate latrines for males and for females aboveground, but none belowground. The work of keeping the mine and the villages sanitarily clean is given out on contract, and the contractor has a staff for the purpose of 45 scavengers, with 3 rubbish carts, and one night-soil cart. Ten of these scavengers work belowground, or two to each pit.

## Water—

The drinking water is supplied from stand pipes, the water being pumped to the villages from a source about 3 miles away. The mining people are brought into the mine from many parts of India,

and the different castes are very numerous, yet they all seem to take to the clean pipe water very readily.

The labour—

The age of the youngest boys employed belowground was said to be 9 years, and 11 years for the youngest girl; and they were employed at 8 and 10 years respectively aboveground. Children that were too young to work were not being taken into the mine.

Nearly all the labour was imported from many parts of India, a great number having been brought from very long distances.

*Wages paid at the Singareni Colliery.*

| Number of persons employed. | Description. | Kind of work. | Wages. |
|---|---|---|---|
| | UNDERGROUND. | | ₹ a. p. |
| 2,564 | Men . . . | Coal cutting. Per heading of 12 ft. × 6 ft. × 3 ft. | 5 0 0 |
| 27 | ,, . . . | Filling. Per lorry . | 0 2 0 |
| 240 | ,, . . . | Sundry labour . | 0 5 0 per day. to 0 6 0 ,, |
| 8 | ,, . . . | Pump winch men . | 0 6 0 ,, to 0 8 0 ,, |
| ... | ,, . . . | Mehtars . . . | 0 5 0 ,, |
| 186 | Boys of 10 to 16 years | Fillers. Per lorry . | 0 2 0 |
| 14 } 20 } | ,, ,, ,, ,, | Sundry work . . | 0 3 6 per day. |
| 2 | Boys under 10 years . | Ditto . . | 0 3 0 ,, |
| 40 | Women above 16 years | Ditto . . | 0 3 6 ,, |
| 446 | ,, ,, ,, | Filling. Per lorry . | 0 2 0 |
| 133 | Girls of 12 to 16 years | Sundry work . . | 0 3 6 per day. |
| 7 | Girls under 12 years . | Ditto . . | 0 3 0 ,, |
| Total below ground. 3,687 | | | |
| | ABOVEGROUND. | | |
| 53 | Men . . . | Enginemen . . | 0 8 0 to 0-12-0 per day. |
| 184 | ,, . . . | Firemen . . | 0 6 0 ,, 0-7-0 ,, |
| 162 | ,, . . . | Banksmen, screeners, and shunters. | 0 5 0 ,, 0-7-0 ,, |

*Wages paid at the Singareni Colliery*—contd.

| Number of persons employed. | Description. | Kind of work. | Wages. |
|---|---|---|---|
| | ABOVEGROUND—*contd.* | | R a. p. per day. |
| 206 | Men . . . | Fitters and others in mechanical department. | 0 5 0 „ R2-4-8 per day. |
| ... | „ . . . | Sundry work . | 0 5 0 „ R1-0-0 „ |
| 16 | Boys of 10 to 16 years | Ditto . . | 0 4 0 per day. |
| 6 | Boys under 10 years | Ditto . . | 0 2 0 to 0-2-6 per day. |
| 39 | Women above 16 years | Ditto . . | 0 3 0 per day. |
| 4 | Women of 12 to 16 years. | Ditto . . | 0 3 0 „ |
| 2 | Girls under 12 years . | Ditto . . | 0 2 0 to 0-2-6 per day. |
| Total above-ground. 672 | | | |
| Total above and below-ground. 4,359 | | | |

A few of the inconveniences that both officials and workmen have to put up with are, the inconvenient money, very poor postal and parcel arrangements, and matters arising from the position of the mine.

The proportions of persons working at a few of the principal employments are as follows:—

The number of hewers were 44·4 per cent. of the total number of persons employed belowground, or 37·6 per cent. of the total number of persons employed both above and belowground.

The number of fillers were 19·8 per cent. of the total number of persons employed belowground, or 16·7 per cent. of the total number of persons employed both above and belowground.

All other persons belowground formed 35·8 per cent. of the total number of persons employed belowground.

In some parts of the mine workings the proportions of hewers, fillers, and trammers were as follows:—

| | Hewers. | Fillers. | Trammers. |
|---|---|---|---|
| | 400 | 200 | 80 |
| Or | 5 | 2½ | 1 |

Output—

It appears that the output per hewer per shift is about from 11 cwts. to 12½ cwts. The output per person employed belowground about 5 cwts. The output for each person employed at the mine about 4½ cwts.

Pujás—

It is worth noting here that there are 13 pujá days in the year, and these are fully given up to the workmen as holidays. These pujá days happen as follows:—1 in January, 1 in February, 3 in March, 3 in July, 1 in September, 2 in October, and 2 in November. The months of April, May, June, August, and December are free from pujás, and the people work on almost every day of those months, except on Sundays, which are always holidays.

When the great variety of people and castes working at this mine, and their great number, are considered in relation to the many things affecting them, such as living in large villages, restrictions as to cleanliness and sanitation, water-supply from standpipes, very defective postage, and the clumsy coinage that is a decided loss to them when sending money to their families, their behaviour and desire to work at the mine, involving living under such circumstances, is really remarkable. It surely shows that much may be made of the native by a suitable course of action and perseverance.

Accidents—

*Classification of accidents.*—All the following terms are used in the colliery office for the classification of mine accidents, namely—1, fatal; 2, serious; 3, severe; 4, slight; 5, very slight. But only those that are fatal, or considered to be serious, are reported to the police.

The following is a copy of the Accident Report Form used at this colliery. It is made out in duplicate, and contains much to recommend it:—

THE HYDERABAD (DECCAN) COMPANY, LIMITED.

SINGARENI COLLIERY.

*Report of Accident to Life or Limb.*

*Date of*_____ *189* .

*Report of*_____*accident that occurred to*_____

**A.** Time accident occurred and date_____

**B.** In_____ **C.** In seam_____ **D.** In gallery_____

**E.** Occupation of injured man_____

**F.** His name_____

**G.** Company's or Contractor's man_____

**H.** How injured_____

**I.** Where injured_____

**J.** Injury, fatal, serious or slight_____

**K.** Taken to hospital or not_____

**L.** Name of official on duty at time_____

**M.** Name of mate on duty at time_____

**N.** Names of witnesses and their occupation_____

**O.** General remarks as to cause, etc._____

YELLANDU,

_____ *189* . . Signature

The particulars of the accidents that happened at this colliery during the year 1894, both fatal and serious, and both aboveground and belowground show, that the total deaths were 9; of these 6 were belowground and 3 on the surface. And of the 9 other serious accidents 8 were belowground.

It is also worth noting that the principal causes of the accidents were few; this is clearly shown by the following table:—

| | Causes. | Belowground. | | Aboveground. | |
|---|---|---|---|---|---|
| | | Fatal. | Serious. | Fatal. | Serious. |
| 1. | Fall of roof stone | 1 | ... | ... | ... |
| 2. | Struck by winding cage | 1 | 2 | ... | ... |
| 3. | Explosives. Struck by material from shots | 1 | 1 | ... | ... |
| | „ Burned | ... | 4 | ... | ... |
| 4. | By coal tubs (derailed and disengaged) | 3 | 1 | ... | ... |
| 5. | Run over by railway wagons | ... | ... | 3 | 1 |
| | Totals | 6 | 8 | 3 | 1 |

The next following is the opinion and statements of the Doctor on the question of health, and the well-being of the work people and other inhabitants of the district.

## Form No. 21.

### Health, Water, Sanitation.

1. General state of health of the people in the Mining district.

1. Taking every thing into consideration the health of the people is good, and will compare favourably with other parts of India.

2. As to the supply and quality of drinking water.

2. The present source of water-supply is drawn from springs a little over three miles from the colliery. The springs empty themselves into a Nullah bed, from which the water is pumped up and brought to the Colliery in iron pipes, where it is collected in a large masonry reservoir, and distributed to the different parts of the mines by smaller pumps. The reservoir is fenced round to prevent the coolies dipping their utensils in the water and fouling it in other ways. The springs being so far from the mines the water is not polluted by the people, and except during the rains when the nullah flows, the water is very good and potable. A large well is being sunk to tap the springs, so that the water instead of being taken from the nullah bed will be pumped from the well, and a pure supply will be had all the year round. The quantity of water pumped up daily (16 hours pumping) is 50,000 gallons, which gives an average of 10 gallons per head of population, besides allowing sufficient quantity for the boilers, etc. An alternative water scheme is in hand, and will be ready in the course of a

month or two. In this case the water will be drawn from a large tank about 2½ miles from the Colliery. There are one or two small wells near the Colliery from which some of the people get their water-supply. For ablution purposes the coolies use the water pumped up from the mines as well as the nullah water.

3. As to sufficiency, etc., of dwelling accommodation.

3. With a few exceptions, all the coolies are supplied with dwelling accommodation by the company, for which no rent is charged. The houses are of four kinds. Pucka houses with corrugated iron roofs; pucka houses with country tile roofs; huts with sun-dried brick-walls, and thatched roofs, and the ordinary whattling dab and thatch huts. The few coolies who have their own huts are of the last named kind. All the houses and huts are built in proper lines and with broad streets between (50 feet wide), and sufficient space betwen each detached house, 12 feet, and hut to allow of free ventilation and cleaning.

4. General Sanitation.

4. The work of sanitation is given out on contract; the contractor having to maintain a staff of 45 scavengers, three rubbish carts, and one night-soil cart. Of these, about 10 work belowground, or two sweepers to each pit.

The bazars and cooly lines are swept twice a day and the garbage, etc., taken and burnt in incinerators built for the purpose. There are eighteen Crawford privies for the use of the labourers, erected in convenient places; these are cleaned and washed out morning and evening, and the night-soil removed and buried in trenches away from all human habitation. There are also urinals in suitable places to keep the coolies from micturating on the ground alongside the walls of their houses. Several dust-bins are also provided for the coolies to throw their rubbish into, which are cleared by the rubbish carts every day. The coolies are prevented from attending the calls of nature in any but places intended for the purpose on the surface, and a staff of six rangers is kept for this work. The forest is being cleared away round the coolies' lines, and the undergrowth cut down for several hundred yards to allow of free perflation. The underground workings are cleaned daily also, and the night-soil brought out and buried.

5. Principal diseases, and probable causes.

5. The following is a summary of diseases treated during 1894. Fever 2,591, Bronchitis 904, Pneumonia 62, Ulcers 989, Skin diseases 569, Diarrhœa and Dysentery 221, Rheumatism 286, other diseases 315. Fever and chest complaints preponderate, and are mostly caused by the sudden changes to which the coolies are exposed, especially when coming out of the heated mines during

the cold nights. The largest number occur during November and early part of December, when the cold weather is setting in. Ulcers come next and are due to slight wounds and abrasions which the coolies receive in the execution of their calling, and these being neglected or washed in the dirty nullah water soon become inflamed and form ulcers. Skin diseases follow, and consist mainly of ringworm and is due to the filthy habits of the people. Bowel-complaints are few, as well as rheumatism, and are largely attributed to chills. Occasionally there is an outbreak of cholera and in every instance the disease has been imported.

6. Other particulars.

| | In year. | Average daily attendance. |
|---|---|---|
| 1893. Number of persons treated as out-patients | 18,301 | 50·14 |
| " " " " in-patients | 1,369 | 3·75 |
| " " deaths from sickness and from accidents— 19 treated, 8 not treated; also 8 from cholera treated, and 3 not treated | | |
| 1894. Number of persons treated as out-patients | 36,925 | 101·13 |
| " " " " in-patients. | 1,838 | 5·08 |
| " " deaths from sickness and from accidents— 19 treated, 5 not treated; also 20 from cholera treated, and 31 not treated. | | |
| Number of houses on Colliery | 2,472 | |
| Population on Colliery— | | |
| Males | 4,221 | |
| Females | 1,423 | |
| Children | 992 | |
| TOTAL | 6,636 | |

Average number of persons living in one hut, 2⅓.

*Names, distance away, approximate population, employment, etc., of neighbouring villages.*

| Names of Villages. | Distance away. | Number of huts. | Population. | Employment. |
|---|---|---|---|---|
| Komurwaram | 10 miles. | 310 | 1,514 | Principally cultivation; but some work at the colliery, and others at the various employments found in most parts of South India. |
| Chudmella | 2 " | 240 | 1,370 | |
| Ooser Kayapelly | 3 " | 189 | 1,143 | |
| Rompett | 5 " | 213 | 1,110 | |
| Sulla Samudrum | 3 " | 93 | 463 | |
| Royel Kaalpelly | 6 " | 105 | 448 | |
| Ragaboyengodah | 6 " | 28 | 122 | |
| Polur | 10 " | 54 | 358 | |
| Kumlapur | 10 " | 12 | 94 | |
| Karaypelly | 7 " | 125 | 636 | |
| Singareni | 6 " | 59 | 275 | |
| Baithumpody | 10 " | 150 | 1,118 | |
| Perpelly | 6 " | 31 | 119 | |
| 13 | | 1,609 | 8770 | |

Form No. 16.—

Particulars of the mining people, their food, clothing, housing, provisions for needy, etc.

1. Name of Mine.—

Singareni Collieries, Hyderabad-Deccan Company, Limited.

2. Provisions for persons injured and their families.—

When a cooly is injured through accident while on duty, and is temporarily disabled, he is allowed "smart money" equivalent to half his salary, as long as he is on the sick list; and should it be necessary he is kept in hospital and allowed free food besides. No provision is made for those permanently disabled or their families. In a couple of cases where the men have lost their eye-sight small bonuses have been given and the men sent to their native place. The Mining Company pays the money. There is no fund for this.

3. Provisions for the sick.—

There is a hospital where in-door and out-door patients are treated; all the coolies are allowed free medicines, which are of the best. When a patient is admitted into hospital he is allowed food and other hospital comforts that the medical officer deems necessary. The medical staff consists of a medical officer, one hospital assistant, one compounder, two male and one female ward servants, and a cook and sweeper. Everything is supplied free. The company pays for its own work-persons, outsiders, etc. The contractors pay the food charges for their own workmen.

4. Provisions for old age.—

None.

5. Provisions for widows.—

None.

6. Provisions for orphans.—

None.

7. Kinds of houses for employés.

The European staff are supplied with pucka-built bungalows which are situated some distance from the mines. The coolies are accommodated in houses of four descriptions—pucka-built houses with corrugated iron sheet roofs, pucka-built houses with country tiled roofs, huts with sun-dried brick walls and thatched roofs; and the common whattling dab and thatch huts.

8. Rent of houses —

No rent is charged for any of the houses.

9. Forms and positions of villages.—

The village consists chiefly of houses constructed by the company for the accommodation of their coolies, and is adjacent to the mines each of the several pits having dwellings close by, so that the work-people live only a couple or three hundred yards from their work. The pucka houses are built in double blocks of 20 rooms (ten on each side to each block) with a space of 200 feet between each block. The huts, which are of a uniform size (10′×13′), are built in rows with 50 feet street in front and 25 feet street in the back of each row, and a space of 12 feet between each hut. The doors of the huts face the main street, there

being no opening in the back. There is a small village about a mile to the north of the colliery, composed of about a hundred huts; these are built by the coolies themselves. The original village of Yellandu or Yellandalapadoo, as it was called, was on this site and consisted of three or four huts before the company began operations.

10. Sanitation above and belowground.—

The work of the sanitation of the colliery is given out on contract. The contractor having to maintain his staff of 45 scavengers, three rubbish carts and one night-soil cart for the cleaning aboveground and belowground. The bazars and cooly lines are swept twice a day, and the garbage, etc., is taken and burned in incinerators built for the purpose. There are 18 Crawford's privies for the use of labourers, erected in convenient places. These are cleaned and washed morning and evening, and the night-soil removed and buried in trenches, away from all human habitation. There are also urinals in suitable places to keep the coolies from micturating on the ground alongside the walls of their houses. Several dust-bins are also provided for the coolies to throw their rubbish into, which are cleared by the rubbish carts every day. The coolies are prevented from attending the calls of nature in any but places intended for the purpose, and a staff of six rangers is kept for this work. The forest is being cleared away round the coolies' lines, and the undergrowth cut down for several hundred yards to allow of free perflation. The underground workings are cleaned daily also, and the night-soil brought out and buried.

11. Clothing.—

The greater number of the coolies dress in a most primitive style. A piece of cloth, a couple or three yards in length, is tied round their loins, while another piece does for a head-dress, the remainder of the body being bare: when it is cold they use a chadar (cotton sheet) to cover the upper part of the body; all these clothes are hand-made by the villagers, and are of a very coarse texture, and the whole suit costs about ₹1-8 or ₹2. The better class of coolies wear English manufactured stuffs; very little flannel is used, as it is too expensive. They however have their kammals or blankets which does the duty of flannel in protecting them from wind and rain. The following will give a fair idea of the clothing required by the better class of coolies and its costs. Women's saries are about 7 yards long and 3 feet wide:—

*Men.*

| | | ₹ | a. | p. |
|---|---|---|---|---|
| 2 Thodathies or dhoti (loin cloths), value | | 3 | 0 | 0 |
| 2 Turbans (head-dress) | „ | 1 | 0 | 0 |
| 2 Angarkhas (jackets) | „ | 1 | 0 | 0 |
| 1 Kammal (blanket) | „ | 1 | 8 | 0 |
| | TOTAL | 6 | 8 | 0 |

*Women.*

| | | | | |
|---|---|---|---|---|
| 2 Saries (robes), value | | 3 | 0 | 0 |
| 2 Cholies (bodies) | „ | 1 | 0 | 0 |
| 1 Chadar (sheet) | „ | 1 | 0 | 0 |
| | TOTAL | 5 | 0 | 0 |

The above generally last a year or two, so that the outlay for clothing is not a very heavy item with the cooly. The dress of the coal cutter while at work underground consists of a chuddi (very much like bathing drawers) and nothing else.

12. Food.—

The food of the coolies consists of rice, jewary or great millet, gram, maize, wheat, peas, lentils, vetch, and other pulse; as also beef, mutton, fish, fowl, milk, and curd, and sweetmeats of sorts. The very poor people subsist principally on boiled rice with a few herbs and condiments or jewary crushed and boiled, mixed with curd or butter-milk. The Mohammedans and the lower classes of the Hindus partake of beef, mutton, fish, and fowl; these are made into curries and eaten with rice or wheaten bread. The Paradésís (the term Paradési is generally applied to a "foreign" native, but principally to north country men) live chiefly on scone, made of wheaten flour and fried in ghee (clarified butter), these are eaten with curries made of the different pulsès (dholl) seasoned with pungent spices. They also eat large quantities of sweetmeats, and drink a lot of milk; a few Paradésís partake of mutton, but beef and fowl are forbidden. Vegetables also largely enter into the diet of all classes of coolies and consists of brinjals, vegetable marrow, greens of sorts, cucumbers, pumpkins, potatoes, etc. Fruits such as bannanas, oranges, mangoes, are largely bought up by the coolies, but the supply is very limited. The cooly generally has three meals a day, one at noon, one at night between 7 and 8 o'clock, and the other in the early morning. The last is cooked over night, as they have to get to work by 6 A.M. The food supplies come from Bezwada and Worangal. Rice mostly from Bezwada, and other food stuff from Worangal. A little comes from Secunderabad.

13. Drinks.—

Almost every cooly indulges in intoxicants. The principal being arrack (liquor distilled from the flowers of the Mahūā, "Bassia lotifolia"), and toddy (the sap of the Palm, "Borassus flabelli formiss," in a state of fermentation). The former is preferred, as its effects are greater. The cooly, however, only indulges on pay-days and holidays; there are exceptions of course, and these partake of it whenever they have a chance. A few of the Paradésís take Indian hemp, either as drink mixed with a little sugar and water or smoke it. Opium is not used except by a few Mohammedans. Water is always the drink excelsior. A little milk is also drunk by children, and some of the grown-up people.

14. Recreations.—

The majority of the coolies (about 90 per cent.) do not go in for recreation in any form; when their work is finished they simply lie about in front of their houses talking to each other. Some of the Paradésís go in for gymnastics, wrestling being their chief pastime. They also get together and have songs accompanied by native music. The Maliahs go in for a little cock-fighting. Card playing also forms a favorite pa-time with many of the coolies. Gambling is indulged in now and again. The children spin tops and play marbles and other childish games. Flying kites is also among their amusements.

15. Nationality.—

The whole of the coolies working at these mines are Indians.

16. Caste.—

The following are the different castes:—

*Paradésís.*—Kachee, Looth, Passee, Chamar, Brahmins, Takoor, Kori, Kunbi, Lohar, Amer, Gadora, Navoo, Koomar, Tali.

*Telugus.*—Chamar, Dhadi, Reddy, Gola, Wadder, Salavad, Naidoo, Koyavad, Mungalavad, Bestha or Boya, Dursee, Dhobee, Kuttlikvadoor, Bunnia.

*Mohammedans.*—Shaik, Syed, Pathan.

*Maharatta.*—Dhadi.

17. Character.—

Paradésís (men from the north of India).—

The Paradési is a hard-working, thrifty individual; his one ambition is to save money and send it to his native place. He makes the best coal-cutter, and does nearly twice as much work in a given time, as compared with the Telugu coal-cutter. He, however, has to be dealt with with a firm hand, as he is given to quarrelling, and on the least provocation becomes riotous; and being clannish he soon has all the other Paradésís to join him. Very few bring their wives to this country, and those few who do, keep them shut up in their houses. They do nothing besides household duties.

Telugus (Natives of these parts).—

The Telugu is a harmless, inoffensive creature, simple in his habits and unambitious by nature, is satisfied with very little. He is not over-fond of work and lacks the energy the Paradési has. If he has enough to keep him in food for a few days, he does not care to work till he finishes it. He has taken kindly to coal-cutting, and, considering the few years the mines have been working, he has made fair progress in his work. The Telugu women are more energetic than the men; they not only do a day's work at the mines, filling coal tubs, etc., but they carry water, prepare the meals, and look after their children, and do a lot of other work in their houses.

Mohammedans.—

The lower class of Mohammedans are a lazy indolent set. They do not like manual labour, and coal-cutting is a little too much for them. They prefer the work of a peon or chowkidar, where they can sit or lie down all day long. The number of Mohammedans working underground are very few, considering this is a Mohammedan State.

Maharattas.—

The same may be said of the Maharatta and his wife, as is said of the Telugu; with the exception that he does not take kindly to underground work and much less to coal-cutting.

18. Social Condition.—

The social condition of the mining coolies in reference to money, food, clothing, and liberty, as compared with that of the agricultural classes, from which most of them are drawn, is quite twice, if not three times as good. A male field labourer generally earns in the surrounding villages from 2 to 3 annas per diem, and a female from $1\frac{1}{2}$ to 2 annas per day. Whereas a male cooly working at the mines receives, if working on the surface, 5 annas, and underground 6 annas a day, except coal-cutting, for which they are paid

by the yard and earn from 10 to 20 rupees per mensem. The women get 3 annas and boys and girls 2 annas per diem. The mining coolies are better housed, and when ill have the hospital to go to, besides other comforts; and above all are sure of receiving their wages monthly.

19. Stature.—

The (Paradésís) coolies from the north of India are strong, sturdy, well-made men, and are taller than the coolies of Southern India. The coolies of Southern India are as a rule a thin puny set, and physically inferior to the Paradésís. The Kóyavad (the aborigines of these parts) are a short, thick, muscular people. The Mohammedans working at the mines are very poor specimens of humanity. The Paradésís live better, and eat more strength-giving food than the other classes of workmen.

20. Colour, features, etc.—

The colour of the Paradésís is light as compared with the people of these parts. There is nothing peculiar as regards the features, except that of the Koyavad, who has a flat nose, rather thick lips, small eyes, and his hair is slightly curly.

Money in use.—

The principal coin of the State is the Halli Sicca rupee, and this is the money the workmen get for all even rupees, but for fractions or annas they get copper Alamgiri dubs, 6 dubs being reckoned as equal to 1 anna. This rate of exchange for dubs, which is at the rate of 96 dubs to the rupee, is kept constant by the Colliery Company and the contractors all the year round, though the rate of exchange varies at the banks from time to time.

The following shows the approximate normal relative values between British money and that of the Hyderabad State:—

| | | | |
|---|---|---|---|
| 100 | British rupees | = | 122 Halli Sicca rupees. |
| 1 | British rupee | = | 1 Halli Sicca rupee and 23 Alamgiri dubs. |
| 127 | Alamgiri dubs | = | 1 British rupee. |
| 104 | „ „ | = | 1 Halli Sicca rupee. |
| 8 | „ „ | = | 1 British anna. |
| 6½ | „ „ | = | 1 anna Halli. |
| About 10 | British rupees | = | 12 Halli Sicca rupees. |

Only Halli Sicca money is taken on the railway of His Highness the Nizam; but British money is taken at the Wadi and Gangeneni Railway stations. Sháhí dubs are not received at railway stations.

# 8.—LIST, AND PARTICULARS, OF GOLD MINES INSPECTED DURING 1894.

## KOLAR GOLD MINES, MYSORE STATE.

| Names of Mining Companies, and mine addresses. | Shafts. | | | | Mineral and vein stuff. | Names and addresses of Superintendents and Captains. | Number of persons employed. | |
|---|---|---|---|---|---|---|---|---|
| | Names or numbers of shafts or sections of mine. | Description of winding shafts and ladderways. | Depth of shafts in feet. | Inclination of vein and shoots, and approximate width from wall to wall. | | | Below ground. | Above ground. |
| 1. Mysore Reefs Gold Mining Co., Ld., Oorgaum, Mysore State. | No. 1. Underlie<br>No. 1. Vertical<br>No. 2. do. | Rectangular<br>Do.<br>Do. | 300<br>220<br>40 | 70°. 44 inches to 5 feet. | Gold. Dark and hard quartz. | Michael Scantlebury, Superintendent.<br>Address, Mysore Reefs mine, Oorgaum, Mysore State. | 145 | 225 |
| 2. South-east Mysore Gold Mining Co., Ld., Oorgaum, Mysore State. | Piggott's<br>Beresford's<br>New engine shaft | Rectangular<br>Do.<br>Do. | 180<br>250<br>80 | 45°. 4 feet | Gold. Dark and hard quartz. | Ditto. | 100 | 135 |
| 3. Mysore Gold Mining Co., Ld., Kolar Gold Field, Mysore State. | Gilbert's<br>Tennant's<br>Henty's<br>Glen's<br>Rowse's<br>Taylor's<br>Plummer's<br>Williams's<br>Blair's<br>McTaggart's<br>Schaw's<br>Shephard's<br>Ribblesdale's<br>Crocker's | Rectangular, vertical, and inclined. | 650<br>600<br>180<br>250<br>1,460<br>550<br>400<br>173<br>173<br>450<br>450<br>160<br>440<br>466 | About 45°. Shoots dip towards the north.<br>6 inches up to 25 feet, average about 3 to 5 feet. | Gold. Hard, dark blue auriferous quartz. | Richard Hancock, Superintendent.<br>Address, Mysore mines, Oorgaum, Kolar gold field, Mysore State. | 1,500 | 1,377 |
| 4. Champion Reef Gold Mining Co. of India, Ld., Oorgaum, Mysore State. | 5 winding shafts, and one for travelling. | Vertical, and sloping with the underlie; rectangular. | 315 to 750 | 30° to 60°. Shoots 30° to 40°. 2 feet up to 12 feet. | Gold. Light grey to dark grey or bluish auriferous quartz. | James Rowe, Superintendent.<br>Address, at the mine. | 1,327 | 944 |
| 5. Oorgaum Gold Mining Co. of India, Ld., Oorgaum, Mysore State. | Taylor's<br>Wallroth's<br>Probyn's<br>Lowe's<br>Main<br>Trial shaft | Rectangular, vertical, and inclined. | 600<br>900<br>1,020<br>610<br>250<br>250 | Dip of shoot is north 60°. Underlie 45° west.<br>Varies from a few inches up to 10 ft., average 30 inches. | Gold. Dark blue, and hard auriferous quartz.<br>"Amethystine". | Robert Collins, Superintendent.<br>Address, at the mine. | 1,440 | 1,126 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6. The Nundydroog Co., Ld., Oorgaum, Mysore State. | Webb's<br>Taylor's<br>Main<br>North<br>Kennedy's | Vertical and inclined; rectangular. | 680<br>1,130<br>1,000<br>444<br>570 | 45°. Shoots 30°. 3 inches up to 10 feet, average 2½ feet. | Gold. Grey to dark blue, very hard auriferous quartz. | Thomas Richards, Superintendent.<br>Address, at the mine. | 1,236 | 722 |
| 7. Mysore West, and Mysore Wynaad Consolidated Gold Mining Cos., Ld., Oorgaum, Mysore State. | 1 working shaft<br>1 pumping shaft | Rectangular<br>Do. | 430<br>437 | 45°. 1 inch up to 5 feet. | Gold. Dark blue auriferous quartz containing galena, and sometimes copper pyrites. | Percy Bosworth Smith, Superintendent.<br>Address, Tank mine, Oorgaum, Mysore State. | 100 | 150 |
| 8. Coromandel Gold Mining Co. of India, Ld., Oorgaum, Mysore State. | Coromandel<br>Prospect | Rectangular<br>Do. | 420<br>500 | 50° to 60°. 3 inches to 12 feet. | Gold. Hard auriferous quartz. | Arthur Llewellyn, Superintendent.<br>Address, at the mine. | 160 | 160 |
| 9. Balaghat Mysore Mines, Ld., Oorgaum, Mysore State. | 3 winding shafts<br>2 ventilation shafts | Vertical and rectangular | 440 to 890 | Champion 40° to 50°. Shoots about 30°. Balaghat 50° to 65°, and shoots vary. | Gold. Dark and hard quartz. | Joseph Pryor, Superintendent.<br>Address, at the mine. | 758 | 245 |
| 10. Nine Reefs Gold Mining Co., Ld., Oorgaum, Mysore State. | Vivian's<br>Bennett's<br>South shaft | Rectangular and vertical. | 462<br>168<br>160 | 50° to 65°. Shoots 30°. 1 to 5 feet. | Gold. Dark blue auriferous quartz mixed with—? | John Woolcock, Superintendent.<br>Address, at the mine. | 120 | 95 |
| 11. Gold Fields of Mysore Mining Co. of India, Ld., Oorgaum, Mysore State. | 1 working shaft<br>2 pumping shafts<br>6 prospecting shafts | Vertical and rectangular. | 100 to 470 | 60° to 70°. Shoots 30° to 40°. 6 inches to 3 feet. | Gold. Light grey to dark grey bluish auriferous quartz, containing iron and arsenical pyrites. | James Rowe, Superintendent.<br>Address, Champion Reef mine, Oorgaum, Mysore State. | 120 | 88 |
| **Other Gold Mines in Mysore.** | | | | | | | | |
| 12. Kempinkote Gold Field, Ld., Hassan District, Mysore State. | Garland's<br>Henty's | Vertical<br>Rectangular | 254<br>231 | 75° to 90°. 13 feet to 15 feet. | Gold. Light and dark laminated quartz. | R. H. P. Bullen, Superintendent.<br>Address, at the mine. | 78 | 109 |
| 13. Honnali Tribute Syndicate. Messrs. Wilson & Co., Madras. | 5 prospecting shafts<br>1 ditto | Vertical and rectangular. | 30 to 111<br>195 | Nearly vertical. 2 inches to 4 feet. | Iron pyrites.<br>Gold. Whitish auriferous quartz. | James Young, Superintendent, Kudurakonda, Honnali Taluk, Shimoga district, Mysore State. | 20 | 20 |

NOTE.—Ribblesdale's shaft, and many other of the shafts named in the list were being deepened.

# 9.—LIST, AND PARTICULARS, OF COAL MINES INSPECTED DURING 1894.

| Names of Collieries and Owners. | Pits and Inclines. | | | | Names and addresses of Managers. | Names and addresses of Assistant Managers. | Number of Persons employed. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Name or number. | Kind. | Depth in feet. | Diameter in feet. | Seams. | | | Below ground. | | Above ground. |
| | | | | | | | Male. | Female. | Male. | Female. |
| | | | | | | "Mining Engineer." | | | | |
| 1. Warora Colliery, Government of India. | No. 1 | Vertical, circular, and rectangular. | 245 | 9 | Hard coal, tough and woody. | George B. Reynolds. Address, Warora, C.P. | Robert Wordsworth. Address, Warora, C.P. | 197 | *Nil.* | 634 | 60 |
| | „ 2 | | 215 | 11 | | | | | | | |
| | „ 3 | | 239 | 9 | | | | | | | |
| | „ 4 | | 181 | 10′4″ × 5′4″ | | | | | | | |
| | „ 5 | | 174 | 10′ × 6′ | | | | | | | |
| | „ 6 | | 102 | 15 | | | | | | | |
| | | | | | | "Under-viewer" | | | | |
| 2. Mohpani Colliery, Nerbudda Coal and Iron Co., Ld. | Helen | Vertical and circular shafts, and inclined drifts. | 405 | 12 | Very strong, semi-bituminous coal. | F. L. G. Simpson. Address, Mohpani, C.P. | William Briddick. Address, Mophani, C.P. | 216 | 82 | 200 | 37 |
| | South river workings | | 157 | 6 | | | | | | | |
| | Old fire workings | | 120 | 7 × 6 | | | | | | | |
| | Old fire workings | | 25 | 6 × 6 | | | | | | | |
| | New mine | | 24 | 5½ × 6 | | | | | | | |
| | Staples | | 34 & 50 | ... | | | | | | | |
| 3. Umaria Colliery, Government of India. | No. 3 pit | Circular | 87 | 14 | Soft coal. | J. A. Maughan. Deceased 20th Dec. 1894. Offg. Manager. H. L. Cleaver. Address, Umaria, C.P. | ... | 942 | 94 | 387 | 51 |
| | „ 4 „ | „ | 190 | 14 | | | | | | | |
| | „ 6 „ | „ | 75 | 10 | | | | | | | |
| | No. 1 incline | Drift | Each | 8 × 6 | | | | | | | |
| | „ 2 „ | „ | about 120 | 8 × 6 | | | | | | | |
| | „ 3 „ | „ | feet long. | 8 × 6 | | | | | | | |
| | | | | | | "Assistants to the Manager." | | | | | |
| 4. Singareni Colliery, The Hyderabad (Deccan) Co., Ld. | No. 13 | Vertical and circular | 196 | 10½ | Coal. Hard and dull. | Thomas Wilkinson Address, Yellandu, N. G. S. Ry., Hyderabad, Deccan | 1. F. T. Howes. 2. J. E. Tyers 3. F. C. Dwane. Address, Yellandu, N. G. S. Ry., Hyderabad, Deccan | 3,061 | 626 | 627 | 45 |
| | „ 14 | Ditto | 181 | 10½ | | | | | | | |
| | „ 15 | Ditto | 140 | 10½ | | | | | | | |
| | 1 hauling incline | Rectangular | From 1,200 | ... | | ... | | | | | |
| | 2 travelling inclines | Ditto | to 2,000 ft. | ... | | ... | | | | | |
| | 6 air shafts. | Ditto. | long. | ... | | ... | | | | | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines, State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Minerals wrought. | REMARKS. (Nearest Thána, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | BENGAL PROVINCE. | | | | | | |
| | | | BURDWAN DIVISION. | | | | | | |
| | | | *Burdwan District.* | | | | | | |
| | | | RANIGANJ. | | | | | | |
| 1 | Nimcha | Bengal Coal Co., Ld., Office, Old Court House Street, Calcutta. | Manager, Bengal Coal Co.'s Raniganj mine, Raniganj, E. I. R. | Raniganj sub-division. | Raniganj | 4 miles | By riding | Coal | Raniganj. |
| 2 | Searsole | | | | | 2 „ | „ carriage | | |
| 3 | Mudhabpur | Ditto | Ditto | Ditto | Ditto | 4 „ | „ Ditto | Ditto | Ditto |
| 4 | Singaran Valley Colliery | F. Guyer, Esq. | Manager, Singaran Valley Colliery, Toposi, E. I. R. | Ditto | ? | ..... | ..... | Ditto. | |
| 5 | Pooranadeep | A. Whyte, Esq. | A. Whyte, Esq., owner of Pooranadeep mine, Raniganj, E. I. R. | Ditto | Raniganj | 5 miles | „ carriage | Ditto. | |
| 6 | Jote Janaki | Raniganj Coal Association, Ld. | Manager, Raniganj Coal Association mine, Toposi, E. I. R. | Ditto | Ditto | 5 miles | „ Ditto | Ditto | Raniganj. |
| 7 | Nundi | Adjai Coal Co. | Manager, Adjai Coal Co.'s Nundi mine, Raniganj, E. I. R. | Ditto | ..... | ..... | ..... | Ditto. | |
| 8 | Searsole | K. R. Malia and K. D. Malia. | Manager, K. R. and K. D. Malia's Searsole mine, Raniganj, E. I. R. | Ditto | Ditto | 2 miles | By carriage | Ditto | Ditto. |
| 9 | Jamaria | Ditto | Ditto | Ditto | Raniganj, or Kalipahari. | 4 „ | „ Ditto | Ditto. | |
| 10 | Roghunath Chak | Jagan Nath Marwari | Manager, Jagan Nath Marwari's Roghunath chak mine, E. I. R. | Ditto | Raniganj | 3 „ | „ riding | | |
| | | | | | | 2 „ | „ carriage | Ditto | Ditto. |
| 11 | New Bonbohal | Ditto | Ditto | Ditto | Ditto | ..... | ..... | Ditto. | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thána, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* BURDWAN DIVISION—*contd.* *Burdwan District*—contd. | | | | | |
| 12 | Munghulpur . . | New Beerbhoom Coal Co. | Manager, New Beerbhoom Coal Co.'s Munghulpur mine, Raniganj, E. I. R. | Raniganj sub-division. | Raniganj . | 3 miles . . | By carriage . | Coal . . | Raniganj. |
| 13 | Bonbohal . . . | Native, Friend & Co. . | Manager, Native Friend & Co.'s Bonbohal mine, Raniganj, E. I. R. | Ditto . . | Ditto . | 10 „ . . | Ditto . | Ditto . . | Ditto. |
| 14 | Dubrona? . . . | Oodiya Ch. Mundal. Address, 114, Banitola, Hautkola, Calcutta. | Manager, Oodiya Ch. Mundal's Dubrona mine, Raniganj, E. I. R. | Ditto . . | ..... | ..... | ..... | Ditto . . | Ditto. |
| 15 | Mamudpur . . . | H. C. Chongder, Guskarah. | Manager, H. C. Chongder Guskarah's Mamudpur mine, Raniganj. | Ditto . . | ..... | ..... | ..... | Ditto. | |
| | | | | KALIPAHARI. | | | | | |
| 16 | Ghoosic . . . | Ram Bhundoo Chatterjee | Manager, Ram Bhundoo Chatterjee's Ghoosic mine. Kalipahari, E. I. R. | Raniganj Sub-division. | Kalipahari | 1 mile . . | By riding . | Coal . . | Raniganj. |
| 17 | Ghoosic . . . | Boleram Coal Co., Ghazipur. | Manager, Boleram Coal Co.'s Ghoosic mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | 1 „ . . | Ditto . | Ditto . . | Ditto. |
| 18 | Ghoosic (Mosla) . . | Burdwan Coal Co. . | Manager, Burdwan Coal Co.'s Ghoosic mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | 1 „ . . | Ditto . | Ditto . . | Ditto. |
| 19 | North Ghoosic . . | Indian Coal Co. . . | Manager, Indian Coal Co.'s North Ghoosic mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |

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|---|---|---|---|---|---|---|---|---|---|
| 20 | Damrah . . . | Damrah Coal Co. . | Manager and Proprietor, Damrah Coal Co.'s Damrah mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |
| 21 | Ghoosic . . . | Ditto . | Manager, Damuda Coal Co.'s Ghoosic mine, Sitarampur, E. I. R. | Ditto . . | Ditto . | 1 mile . . | By riding . | Ditto . . | Raniganj. |
| 22 | East Ghoosic . . | Simon Creet, Esq. . . | Manager, Mr. Simon Creet's East Ghoosic mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |
| 23 | Chatapathar . . | Dwarka Nath Khettri . | Manager, Dwarka Nath Khettri's Chatapathar mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | 1 mile . . | By riding or trolly. | Ditto . . | Raniganj. |
| 24 | Nicha . . . . | Nadia Coal Co. . . | Manager, Nadia Coal Co's Nicha mine, Kalipahari E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |
| 25 | Keshubgunge . . | R. L. Dutta & Co. . | Manager, R. L. Dutta & Co.'s Keshubgunge mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |
| 26 | Ditto . . . | Standard Coal Co. . | Manager, Standard Coal Co.'s Keshubgunge mine, Kalipahari, E. I. R. | Ditto . | Ditto . | ..... | ..... | Ditto. | |
| 27 | Ditto . . . | Poolchand Marwari . | Manager, Poolchand Marwari's Keshubgunge mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |
| 28 | Baghboni . . . | Baghboni Coal Co. . | Manager, Baghboni Coal Co.'s Baghboni mine, Kalipahari, E. I. R. | Ditto . . | Ditto . | ..... | ..... | Ditto. | |
| | | | | ASSANSOL. | | | | | |
| 29 | Charanpore . . . | Messrs. Apcar & Co, 19 Radha Bazar, Calcutta. | Manager, Messrs. Apcar & Co.'s Charanpore mine, Assansol, E. I. R. | Raniganj sub-division. | Assansol . | 5 miles . . | By trolly or private line. | Coal . . | Assansol. |
| 30 | Bora Chak . . . | Ditto ditto | Manager, Messrs. Apcar & Co.'s Bora Chak mine, Assansol, E. I. R. | Ditto . . | Assansol or Sitarampur. | 2 „ . . | „ riding . | Ditto . . | Barakar Out-post. |
| 31 | Dhadka . . . | New Beerbhoom Coal Co. | Manager, New Beerbhoom Coal Co.'s Dhadka mine, Assansol, E. I. R. | Ditto . . | Assansol . | 2 „ . . | Ditto . | Ditto . . | Assansol. |

## LIST OF MINES IN INDIA—*contd.*

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | BURDWAN DIVISION—*contd.* | | | | | |
| | | | | *Burdwan District*—contd. | | | | | |
| 32 | Seebpore | Katras Jherriah Coal Co., Ld. | Manager, Katras Jherriah Coal Co.'s Seebpore mine, Assansol, E. I. R. | Raniganj sub-division. | Assansol | 5 miles | By Coal Co.'s engine or trolly. | Coal | Assansol. |
| 33 | Nandirajpur | Adjai Coal Co. | Nandirajpur | Ditto | Ditto | 7 to 8 miles | Shibpur Branch line and horse or palki. | Ditto. | |
| 34 | Nandirajpur mine | Babu Khudiram Chukervarti. | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. | |
| 35 | Jamunia mine | Equitable Coal Co. | Jamunia | Ditto | Ditto | Ditto | Ditto | Ditto. | |
| 36 | Sorakdie | N. A. Hodges, Esq. | Manager, N. A. Hodges' Sorakdie mine, Assansol, E. I. R. | Ditto | Ditto | ..... | ..... | Ditto. | |
| 37 | Baraboni | New Baraboni Coal Co. | Manager, New Baraboni Coal Co.'s Baraboni mine, Assansol, E. I. R. | Ditto | Ditto | ..... | ..... | Ditto. | |
| 38 | Old Baraboni | Baraboni Coal Co., Ld. | Manager, Baraboni Coal Co.'s Old Baraboni mine, Assansol. E. I. R. | Ditto | Ditto | ..... | ..... | Ditto. | |
| | | | | SITARAMPUR. | | | | | |
| 39 | Luchipur | Equitable Coal Co., Ld. | Manager, Equitable Coal Co.'s Luchipur mine, Deshurghur. | Raniganj sub-division. | Sitarampur | ..... | ..... | Coal. | |
| 40 | Sodepore | Bengal Coal Co., Ld. | Manager, Bengal Coal Co.'s Sodepore mine, Sitarampur, E. I. R. | Ditto | Ditto or Barakar. | 4 miles | By carriage | Ditto | Barakar outpost. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 41 | Luchipur | Joint Stock Co. | Manager, Joint Stock Co.'s Luchipur mine, Sitarampur, E. I. R. | Ditto | Sitarampur | 1 „ | „ trolly | Ditto | Ditto. |
| 42 | Barmonnia | Damuda Coal Co. | Manager, Damuda Coal Co.'s Barmonnia mine, Sitarampur, E. I. R. | Ditto | Ditto | 3 „ | „ riding | Ditto | Ditto. |
| 43 | Damuda | Ditto | Manager, Damuda Coal Co.'s Damuda mine, Sitarampur, E. I. R. | Ditto | Ditto or Damuda, B.N.R. | ..... | Ditto | Ditto | Ditto |
| 44 | Belrooi | New Beerbhoom Coal Co., Ld. | Manager, New Beerbhoom Coal Co.'s Belrooi mine, Sitarampur, E. I. R. | Ditto | Sitarampur | 1 mile | Ditto | Ditto | Ditto. |
| 45 | Luchipur | Bholanath Dhur & Co. | Manager, Bholanath Dhur & Co.'s Luchipur mine, Sitarampur. E. I. R. | Ditto | Ditto | 1 „ | „ trolly | Ditto | Ditto. |
| 46 | Ditto | Jaggessur Ray & Co. | Manager Jaggessur Ray & Co.'s Luchipur mine, Belrooi, Sitarampur, E. I. R. | Ditto | Ditto | ..... | ..... | Ditto. | |
| 47 | Bamandiah | Bholanath Dhur & Co. | Manager, Bholanath Dhur & Co.'s Bamandiah mine, Sitarampur, E. I. R. | Ditto | Ditto | 1 mile | „ trolly | Ditto | Barakar outpost. |
| 48 | Ditto | Moodun Sodun Roy | Manager, Moodun Sodun Roy's Bamandiah mine, Belrooi, Sitarampur E. I. R. | Ditto | Ditto | ..... | ..... | Ditto. | |
| 49 | Ditto | P. C. Dutt | Manager, P.C. Dutt's Bamandiah mine, Sitarampur, E. I. R. | Ditto | Ditto | ..... | ..... | Ditto. | |
| 50 | Mouthdih | Burdwan Coal Co. | Manager, Burdwan Coal Co.'s Mouthdih mine, Sitarampur, E. I. R. | Ditto | Ditto | 3 miles | „ riding | Ditto | Barakar outpost. |
| 51 | Sundar Chak | Private | Manager, Sundar Chak mine, Sitrampur, E. I. R. | Ditto | Ditto | 3 „ | „ carriage | Ditto | Ditto. |
| 52 | Neamatpur | Joint Stock C | Manager, Joint Stock Co.'s Neamatpur mine, Sitarampur, E. I. R. | Ditto | Ditto | 2 „ | „ riding | Ditto | Ditto. |

## LIST OF MINES IN INDIA—contd.

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thána, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* BURDWAN DIVISION—*contd.* *Burdwan District*—contd. | | | | | |
| 53 | Khoyrabad | Joint Stock Co. | Manager, Joint Stock Co.'s Khoyrabad mine, Sitarampur, E. I. R. | Raniganj Sub-division. | Sitarampur | 10 miles | By private line and trolly. | Coal | Barakar outpost. |
| 54 | Pannuria | Ditto | Manager, Joint Stock Co.'s Pannuria mine, Sitarampur, E. I. R. | Ditto | Ditto | 12 „ | By riding or trolly. | Ditto | Ditto. |
| 55 | Bamandiah | D. Khettri | Manager, D. Khettri's Bamandiah mine, Sitarampur, E. I. R. | Ditto | Ditto | 3 „ | „ private line or Trolly. | Ditto | Ditto. |
| 56 | Chota Dhemo | Baman Das Mukherji | Manager, Baman Das Mukherji's Chota Dhemo mine, Sitarampur, E. I. R. | Ditto | Ditto | 2 „ | „ riding | Ditto | Assansol. |
| 57 | Chota Dhemo | Ram B. Chatterji | Manager, Ram B. Chatterji's Chota Dhemo mine, Sitarampur, E. I. R. | Ditto | Ditto | 2 „ | „ riding | Ditto | Ditto. |
| 58 | Mouthdih | Mouthdih Coal Co. | Manager, Mouthdih Coal Co.'s Mouthdih mine, Sitarampur, E. I. R | Ditto | Ditto | 3 „ | Ditto | Ditto | Barakar outpost. |
| 59 | Do. | Jadu Gopal Chatterji | Manager, Jadu Gopal Chatterji's Mouthdih mine, Sitarampur, E. I. R. | Ditto | Ditto | 3 „ | Ditto | Ditto | Ditto. |
| 60 | Chota Dhemo | Laik & Co. | Manager, Laik & Co.'s Chota Dhemo mine, Sitarampur, E. I. R. | Ditto | Ditto | 2 „ | Ditto | Ditto | Assansol. |
| 61 | Mouthdih | Gopal Chandra Mitra | Manager, Gopal Chandra Mitra's Mouthdih mine, Sitarampur, E. I. R. | Ditto | Ditto | 3 „ | Ditto | Ditto | Barakar outpost. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | BARAKAR. | | | | | |
| 62 | Antonia and Kendua . | Bengal Iron & Steel Co., Ld. . . . . | Manager, Bengal Iron and Steel Co.'s Antonia mine, Sitarampur, E. I. R. | Raniganj Sub-division. | Barakar . . | 1 mile . . | By riding . | Coal . . | Barakar out-post. |
| 63 | Desherghur . . . | Equitable Coal Co., Ld. | Manager, Equitable Coal Co.'s Desherghur mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 3 miles . . | „ carriage . | Ditto . . | Ditto. |
| 64 | Sanctoria . . . | Bengal Coal Co., Ld. . | Manager, Bengal Coal Co.'s Sanctoria mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 3 „ . . | Ditto . | Ditto . . | Ditto. |
| 65 | Laikdi . . . | Ditto . . | Manager, Bengal Coal Co.'s Laikdi mine, Barakar, E. I. R. | Ditto . . | Ditto . . | ..... | ..... | Ditto. | |
| 66 | Borrea . . . | New Beerbhoom Coal Co., Ld. | Manager, New Beerbhoom Coal Co.'s Borrea mine, Barakar, E. I. R. | Ditto . . | Ditto . . | ..... | ..... | Ditto. | |
| 67 | Bagunia . . . | R. H. Scorer, Esq. . | Manager, Mr. R. H. Scorer's Bagunia mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 1 mile . . | By carriage . | Ditto . . | Barakar out-post. |
| 68 | Kumardubi . . . | Barakar Coal Co., Ld. . | Manager, Barakar Coal Co.'s Kumardubi mine, Barakar, E. I. R. | Ditto . . | Ditto . . | ..... | ..... | Ditto. | |
| 69 | Gangootiya . . . | Bengal Nagpur Coal Co., Ld. | Manager, Bengal Nagpur Coal Co.'s Gangootiya mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 4 miles . . | By riding . | Ditto . . | Barakar out-post. |
| 70 | Bagunia . . . | Benori Lal Mukerji . | Manager, Benori Lal Mukerji's Bagunia mine, Barakar, E. I. R. | Ditto . . | Ditto . . | ..... | ..... | Ditto. | |
| 71 | Ditto . . . | Laik Coal Co. . . | Manager, Laik Coal Co.'s Bagunia mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 1 mile . . | By carriage . | Ditto . | Barakar out-post. |
| 72 | Ditto . . . | Nundo Lal Garia . . | Manager, Nundo Lal Garia's Bagunia mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 1 „ . . | Ditto . | Ditto . . | Ditto. |
| 73 | Ditto . . . | Jogendro Nath Mukherji | Manager, Jogendro Nath Mukherji's Bagunia mine, Barakar, E. I. R. | Ditto . . | Ditto . . | 1 „ . . | Ditto . | Ditto . . | Ditto. |
| 74 | Ditto . . . | Deni, M. Sandal . . | Manager, Deni, M. Sandal's Bagunia mine, Barakar, E. I. R. | Ditto . . | Ditto . . | ..... | ..... | Ditto. | |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **BENGAL PROVINCE—*contd.*** | | | | | | | | |
| **CHOTA NAGPUR DIVISION.** | | | | | | | | |
| ***Hazaribagh District.*** | | | | | | | | |
| **GIRIDIH.** | | | | | | | | |
| 1. Kurhurbari | E. I. Railway Company | Manager, E.I. Railway Co.'s Collieries, Giridih, E. I. R. | Giridih, Sub-division Giridih. | Giridih | 2 miles | By push-push. | Coal mines. | |
| 2. Serampur | Ditto | Ditto | | | 3 miles | | | |
| 3. Kuldiah | Bengal Coal Company | Manager, Bengal Coal Company, Limited, Giridih, E. I. R. | | | Ditto | | | |
| 4. Kamaljare | Giridih Colliery Company, Limited. | Manager, Giridih Colliery Company, Limited, Giridih, E. I. R. | | | Ditto | | | |
| 5. Choonjka | Raniganj Coal Association, Limited. | Manager, R. L. Association, Giridih, E. I. R. | | | 4 miles | | | |
| 6. Serampur | Oriental Coal Company, Limited. | Manager, Oriental Coal Company, Limited, E. I. R. | | | 1½ miles | | | |
| 7. Satighat | Rakhal Das Tah and Company. | Rakhal Das Tah and Company, Giridih, E. I. R. | | | 4 miles | | | |
| 8. Bayra | Mr. E. Myers | Mr. E. Myers, Giridih, E. I. R. | | | 2⅔ miles | | | |
| 1. Bhadarya | Messrs. F. F. Christian and Company. | Tisri *vid* Bhurai Post Office. | Village Jaipur or Chitrapur in Koderma, sub-division Giridih. | Giridih | 60 miles | By palki bearers or push-push. | Mica. | |
| 2. Ghararia | | | | | | | | |
| 3. Meghatari | | | | | | | | |
| 4. Charki Lalki | | | | | | | | |
| 5. Lookya Singa | | | | | | | | |
| 6. Pathalhia | | | | | | | | |
| 7. Taraghatia | | | | | | | | |
| 8. Penraria | | | | | | | | |
| 9. Hudhudwa | | | | | | | | |
| 10. Karuantar | | | Village Mahapur or Karharia in Koderma, sub-division Giridih. | | | | | |
| 11. Sindwatand | | | | | | | | |
| 12. Loothahari | | | | | | | | |
| 13. Charkipahari | | | | | | | | |
| 14. Bajarhari | | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 15. Satwa Khad<br>16. Karapathal<br>17. Latgodwa<br>18. Mohchichya<br>19. Sofakhad<br>20. Mohuaria<br>21. Jatahi Khad<br>22. Sarlahi | Babu Raj Krishna Sahana | Moglamarun in Koderma | Sub-division Giridih | Ditto | Ditto | Ditto | Do. |
| 23. Satanrati<br>24. Sewa<br>25. Satanrati<br>26. Jamundaha<br>27. Mowatand<br>28. Paproo<br>29. Sirsiria<br>30. Paparia<br>31. Sarlahi<br>32. Barakola<br>33. Lachmania<br>34. Teshra Khad<br>35. Hataria<br>36. Katahia<br>37. Satua Khad<br>38. Barharsa Khad<br>39. Kudar Katwa<br>40. Pasra Khad<br>41. Harharia Khad<br>42. Basra Khad | Ditto ditto | Baratand in Koderma | Police-station Koderma, sub-division Giridih. | Ditto | Ditto | Ditto | Do. |
| 43. Mohsoda<br>44. Mohsualia<br>45. Gamaria<br>46. Ghootia<br>47. Satalrati<br>48. Baralaktahia<br>49. Sarlahi<br>50. Duaki Mohua<br>51. Chirchiria<br>52. Barharia<br>53. Showtha<br>54. Sabarki<br>55. Ghogsahi<br>56. Nankibhuti<br>57. Lokaiya<br>58. Lomchonchi | W. R. Macdonald, Esq. | Koderma | Baratand in Koderma police-station, sub-division Giridih. | Ditto | Ditto | Ditto | Do. |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **BENGAL PROVINCE—*contd.*** | | | | | | | | |
| **Chota Nagpur Division—*contd.*** | | | | | | | | |
| ***Hazaribagh District*—contd.** | | | | | | | | |
| 59. Sijua | Babu Nund Lal | Domechanch | Kakokudar | | | | | |
| 60 Billma | | | | | | | | |
| 61. Goura Moron | | | | | | | | |
| 62. Kadootia | W. D. Clyburn, Esq. | Koderma | Taraghati | | | | | |
| 63. Kesma Khad | | | | | | | | |
| 64. Taraghaterate | | | | | | | | |
| 65. Soti | | | Pandidera | | | | | |
| 66. Sabrahi | | | | | | | | |
| 67. Pepurua Khad | | | | | | | | |
| 68. Koonda | | | Alukdiaha | | | | | |
| 69. Chorki | | | Kakukudan | | | | | |
| 70. Beharathan | | | | | | | | |
| 71. Degha Khad | | | | | | | | |
| 72. Bootaria | | | | | | | | |
| 73. Bunhia | | | Jaipur... Koderma police-station, sub-division Giridih. | Giridih | 60 miles | By palki bearers or push-push. | Mica. | |
| 74. Jaderwa | | | Inderwa | | | | | |
| 75. Hodhodwa | | | Dharam | | | | | |
| 76. Natkanwa | | | | | | | | |
| 77. Baria | | | Champadih | | | | | |
| 78. Peprahi | | | | | | | | |
| 79. Taraghati | | | Taraghati | | | | | |
| 80. Lalki | | | | | | | | |
| 81. Kanghia | | | | | | | | |
| 82. Langra Paras | | | Jamsoti | | | | | |
| 83. Rohai | | | | | | | | |
| 84. Pathalgadwa | | | Karipahri *alias* Muglamarun. | | | | | |
| 85. Surangi | | | | | | | | |
| 86. Panihoia | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| 87. Batharia | | | | Muglamarun | | | | | | |
| 88. Kari | | | | | | | | | | |
| 89. Chirchiria | | | | | | | | | | |
| 90. Daghoia | | | | | | | | | | |
| 91. Satalrati | | | | | | | | | | |
| 92. Mohogaya | | | | | | | | | | |
| 93. Paisara | | | | | | | | | | |
| 94. Barhowa | | | | Baratand | | Giridih | 60 miles | By palki bearers or push-push. | Mica. | |
| 95. Bhadaria | | | | | | | | | | |
| 96. Kararia | | | | | | | | | | |
| 97. Pamhia | | | | | | | | | | |
| 98. Suarlite | | | | | | | | | | |
| 99. Gamaria | | | | | | | | | | |
| 100. Kaharia | | | | | | | | | | |
| 101. Murlipahari | | | | | | | | | | |
| 102. Aglagwa | | | | | | | | | | |
| 103. Thanahia | | Messrs. F. F. Christian and Company. | Tisrí *vid* Office. | Bhurai Post | | | | | | |
| 104. Jhagrahia | | | | | | | | | | |
| 105. Bhutahi | | | | | Police-station Koderma, sub-division Giridih. | | | | | |
| 106. Nakatia | | | | | | | | | | |
| 107. Seathsa | | | | | | | | | | |
| 108. Karipahri | | | | | | | | | | |
| 109. Tekoa | | | | | | | | | | |
| 110. Khairoatare | | | | | | | | | | |
| 111. Galgohwa | | | | | | | | | | |
| 112. Lasigua | | | | | Baratand | | | | | |
| 113. Bhalagi | | | | | Ditto | | | | | |
| 114. Bharia | | | | | Ditto | | | | | |
| 115. Margoa | | | | | Ditto | | | | | |
| 116. Sugoa | | | | | Ditto | | | | | |
| 117. Hatiaria | | | | | Ditto | | | | | |
| 118. Hookaparoa | | | | | Ditto | | | | | |
| 119. Naktahia | | | | | Ditto | | | | | |
| 120. Lalki | | | | | Ditto | | | | | |
| 121. Kutkutua | | | | | Ditto | | | | | |
| 122. Sarlahia | | | | | Ditto | | | | | |
| 123. Laneehonchi | | | | | Ditto | | | | | |
| 124. Bhusbhuswa | | | | | Ditto | | | | | |
| 125. Pattahia | | | | | Ditto | | | | | |
| 126. Angarchaga | | | | | Ditto | | | | | |
| 127. Dakahia | | | | | Ditto | | | | | |
| 128. Khos Dangarkutia | | | | | Ditto | | | | | |
| 129. Dudhpania | | | | | Ditto | | | | | |
| 130. Baroa | | | | | Ditto | | | | | |
| 131. Harma | | | | | Kakokudar | | | | | |
| 132. Baria Khad | | | | | ..... | | | | | |
| 133. Tamabi | | | | | ..... | | | | | |

## LIST OF MINES IN INDIA—contd.

| Name of Mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **BENGAL PROVINCE—*contd.*** | | | | | | | | |
| **Chota Nagpur Division—*contd.*** | | | | | | | | |
| ***Hazaribagh District*—concld.** | | | | | | | | |
| 134. Pamahi | Messrs. F. F. Christian and Company. | Tisri *vid* Bhurai Post Office. | Kakokudar, Koderma police-station, sub-division Giridih. | — | | | | |
| 135. Sujima hudar | | | | | | | | |
| 136. Nilwadaha | | | | | | | | |
| 137. Bhadaria | | | | | | | | |
| 138. Sugi Pahar | | | | | | | | |
| 139. Pathalhia | | | | | | | | |
| 140. Bagaloa | | | | | | | | |
| 141. Park Pahar | | | | | | | | |
| 142. Desurwa | | | | | | | | |
| 143. Durbashwa | | | | | | | | |
| 144. Bhondadiha | | | | | | | | |
| 145. Baroa | | | | | | | | |
| 146. Guthohi | | | | | | | | |
| 147. Fatrahi | | | | Giridih | 60 miles | By palki bearers or push-push. | Mica. | |
| 148. Pattahia | | | Meghatari | | | | | |
| 149. Meghatari | | | Bisnitikar | | | | | |
| 150. Bishnitikar | | | Bishenpur | | | | | |
| 151. Bishenpur | | | Simratari | | | | | |
| 152. Samratari | | | Mohuatand | | | | | |
| 153. Mohuatand | | | Kholokthombi | | | | | |
| 154. Kholokthombi | | | Sidwatand | | | | | |
| 155. Sidwatand | | | Karamtand | | | | | |
| 156. Karamtand | | | Dharam | | | | | |
| 157. Dharam | | | Champadih. | | | | | |
| 158. Champodi | | | Kaharia. | | | | | |
| 159. Karharia | | | Sapaha. | | | | | |
| 160. Sapaha | | | Jangal Sirkar (Koderma R. F.) | | | | | |
| 161. Jangal Sirkar | | | | | | | | |
| 162. Jatahi | Babu Raj Krishna Sahana | Koderma | Maglamarun | Ditto | Ditto | Ditto | Do. | |
| 163. Haraia | | | | | | | | |
| 164. Charkapathal | | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 165. Barwadih | C. A. Dickson, Esq. | Ditto | Ditto | Ditto | Ditto | Ditto | Do. |
| 166. Paprewa | | | | | | | |
| 167. Salaia | | | | | | | |
| 168. Panihia | | | | | | | |
| 169. Dandhy | | | | | | | |
| 170. Aovoa | | | | | | | |
| 171. Paklahia | | | | | | | |
| 172. Basaria | | | | | | | |
| 173. Kusumbha | | | | | | | |
| 174. Lakmondua | W. R. Macdonald, Esq. | Ditto | Koderma | Ditto | Ditto | Ditto | Do. |
| 175. Larlarwa | | | | | | | |
| 176. Subrahia | | | | | | | |
| 177. Mitkobel | | | | | | | |
| 178. Tejwa | | | | | | | |
| 179. Naddi | | | | | | | |
| 180. Latweya | | | | | | | |
| 181. Sissirwa | | | | | | | |
| 182. Bushuswa | | | | | | | |
| 183. Hinda | | | | | | | |
| 184. Dhamapohree | | | | | | | |
| 185. Rama | | | | | | | |
| 186. Mutchenia | Babu Choonilal Neogi | Gawan | Gawan, subdivision Giridih | Giridih | 60 miles | Ditto | Do. |
| 187. Mauzadiha | | | | | | | |
| 188. Dhirwai Pahory | Babu Beharilal Gossain | Ditto | | | | | |
| 189. Chit Panke | | | | | | | |
| 190. Sankh | Lalji Mistri | Giridih | | | | | |
| 191. Charpathal | | | | | | | |
| 192. Bedro | Messrs. F. F. Christian and Company. | Tisrí *viâ* Bhurai Post Office | Gawan police-station, subdivision Giridih. | Ditto | About 40 miles. | By palki bearers or push-push. | Do. |
| 193. Nemadih | | | | | | | |
| 194. Kushmaboi | | | | | | | |
| 195. Nagowan | | | | | | | |
| 196. Lachenbathan | | | | | | | |
| 197. Gookoorahi | | | | | | | |
| 198. Katid | | | | | | | |
| 199. Machwa or Modhua Pahary. | Tekaetni of Doranda | Doranda | | | | | |
| 200. Simeria | Babu Jowahir Moll | Koderma | Koderma police-station, subdivision Giridih. | Ditto | About 50 miles. | Ditto | Do. |
| 201. Kajerodih | | | | | | | |
| 202. Masnudih | Messrs. F. F. Christian and Company. | Tisrí *viâ* Bhurai | | | | | |
| 203. Doondbar | Toofani Singh | Koderma | | | | | |
| 204. Pemia | Narni Das | Ditto | | | | | |
| 205. Dome Chanch | Messrs. F. F. Christian and Company. | Tisrí *viâ* Bhurai | | | | | |
| 206. Asakooha | Tikait Thakur Narang Singh. | Ghorunji | Kharakdiha police-station, subdivision Giridih. | Ditto | About 20 miles. | Ditto | Do. |
| 207. Gooraipur | | | | | | | |
| 208. Jharn | | | | | | | |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| BENGAL PROVINCE—*contd.* | | | | | | | | |
| Chota Nagpur District—*contd.* | | | | | | | | |
| *Manbhum District.* | | | | | | | | |
| 1. Mugma mine | Ram Nath Bhuttacharjee | Pitakeyari, police-station Nirsha. | Mugma | Police-station Nirsha. | 2 miles | Palki | Coal mine. | |
| 2. Rajpura mine | Sashi Bhusan Gossami | Rajpura, police-station Nirsha. | Rajpura | Ditto | 5 miles | Ditto | Do. | |
| 3. Ditto | Sambhu Nath Roy | Chirkunda, police-station Nirsha. | Ditto | Ditto | Ditto | Ditto | Do. | |
| 4. Ditto | Manji Bhasta | Rajpura, police-station Nirsha. | Ditto | Ditto | Ditto | Ditto | Do. | |
| 5. Ditto | Rohini Kumar Rai | Barakar | Ditto | Ditto | Ditto | Ditto | Do. | |
| 6. Ditto | Dariyao Khan Kaboli | Rajpura, police-station Nirsha. | Ditto | Ditto | Ditto | Ditto | Do. | |
| 7. Ditto | Sristidhar Mukherji | Ditto ditto | Ditto | Ditto | Ditto | Ditto | Do. | |
| 8. Chattatour mine | Sital Chandra Set | Chattatour, police-station Nirsha. | Ditto | Ditto | Ditto | Ditto | Do. | |
| 9. Pandedi mine | Pandedi Coal Company | Pandedi, police-station Nirsha. | Pandedi | Ditto | 1½ miles | Ditto | Do. | |
| 10. Hatibari mine | Hatibari Coal Company | Hatibari, police-station Nirsha. | Hatibari | Ditto | 1 mile | Ditto | Do. | |
| 11. Agaya Birsingpur | East Indian Coal Company | Charuinala, police-station Nirsha. | Agaya Birsinghpur | Ditto | 3 miles | Ditto | Do. | |
| 12. Bhāljuri mine | Nanda Gorain | Nirsha | Bhaljura | Ditto | 1½ miles | Ditto | Do. | |
| 13. Pitakeyari mine | Prasanna Kumar Rai | Ditto | Pitakeyari | Ditto | Ditto | Ditto | Do. | |
| 14. Ketardi mine | Ishan Ghosh | Kaldi, police-station Nirsha | Ketardi | Ditto | 6 miles | Ditto | Do. | |
| 15. Topataur mine | Raja Madhu Sudan Singha | Podderdi, police-station Nirsha. | Topatand | Nirsha, police-station. | 3 miles | Ditto | Do. | |
| 16. Bandarchuya mine | Panchkori Mukherji | Bagar, district Burdwan | Bandarchuya | Ditto | Ditto | Ditto | Do. | |
| 17. Sangamahul mine | Say Nath Bandyopadhya | Sangamahul, police-station Nirsha. | Sangamahul | Ditto | 4 miles | Ditto | Do. | |
| 18. Nirsha Satkheta mine | Prasunna Kumar Rai | Pitakeyari, police-station Nirsha. | Nirsha | Ditto | 1 mile | Ditto | Do. | |
| 19. Kanadi Bhalber mine | Ram Lal De | Calcutta, Chunagali, house No. 8. | Kanadi Bhalber | Ditto | 8 miles | Ditto | Do. | |

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|---|---|---|---|---|---|---|---|
| 20. Saluk Chapra mine | Jogendra Gossami | Serampur, district Hooghly | Salukchapra | Ditto | Ditto | Ditto | Do. |
| 21. Charninala Magma mine | Rohini Kumar Rai | Barakar | Charninala | Ditto | 3 miles | Ditto | Do. |
| 22. Patlabari | South Barakar Coal Company. | Calcutta | Patlabari | Barakar | 4 miles | Palki or cart | Do. |
| 23. Tantikanali mine | Bengal Coal Company | Ditto | Nayekdi | Ditto | 2 miles | Ditto | Do. |
| 24. Dhankura mine | Ditto | Ditto | Dhankura | Ditto | Ditto | Ditto | Do. |
| 25. Kumardubi mine | Barakar Coal Company | Ditto | Kumardubi | Ditto | Ditto | Ditto | Do. |
| 26. Igarkur mine | Haradhon Layek | Sodhpur, police-station Assansol. | Igarkur | Ditto | 3 miles | Ditto | Do. |
| 27. Ditto | Umesh Bhuttacharjee | Mankar, police-station Budbud, district Burdwan. | Ditto | Ditto | Ditto | Ditto | Do. |
| 28. Ditto | Umesh Roy and others | Chirkunda, police-station Budbud, district Burdwan. | Ditto | Ditto | Ditto | Ditto | Do. |
| 29. Ditto | Surendra Nath Layek | Begunia, district Burdwan | Ditto | Ditto | Ditto | Ditto | Do. |
| 30. Ditto | Krishna Chundra Madak | Chirkunda | Ditto | Ditto | Ditto | Ditto | Do. |
| 31. Ditto | Jadu Gopal Chatterjee | Kalipahari, police-station Nirsha. | Ditto | Ditto | Ditto | Ditto | Do. |
| 32. Coal mine | Mr. J. Deveria | Purulia | Monkurah, Raghunathpur. | Damodar station | 3 miles | Ditto | Do. |
| 33. Sijna mine | Finlay, Muir and Company | Sijna, Rajganj | Village Sijna | Katras station, Jharia extension, East Indian Railway. | 1½ miles | Ditto | Do. |
| 34. Angarpatra mine | Radhanath Trigunait | Malikara, police-station Topechanchi. | Village Angarpatra | Ditto | ½ mile | Ditto | Do. |
| 35. Ditto | Prasanna Kumar Roy | Ditto | Ditto | Ditto | Ditto | Ditto | Do. |
| 36. Ditto | Nagendra Chundra Mitra | Ditto | Ditto | Ditto | Ditto | Ditto | Do. |
| 37. Ditto | Jogendra Nath Vakil | Ditto | Ditto | Ditto | Ditto | Ditto | Do. |
| 38. Panchgari mine | Katras Jharia Coal Company. | Katras and Panchgari, police-station Rajganj. | Malikara, Chaitudi, Kailudi, Chhatabad, and Salunpur. | Ditto | Ditto | Ditto | Do. |
| 39. Kumarjuri mine | Layek Coal Company | Nakarka, police-station Rajganj. | Ditto | Ditto | 1 mile | Ditto | Do. |
| 40. Nayabadi mine | Barakar Coal Company | Nayabad, police-station Jharia. | Nayabad | Dhanbad station | 4 miles | Palki | Do. |
| 41. Kendali mine | East Indian Coal Company | Kendadi, police-station Jharia. | Kendadi | Ditto | Ditto | Ditto | Do. |
| 42. Khayra mine | Ditto | Ditto | Khayra | Ditto | 5 miles | Ditto | Do. |
| 43. Barari mine | Ditto | Ditto | Barari | Ditto | 2 miles | Ditto | Do. |
| 44. Bhakatdi | Bengal-Nagpur Coal Company. | Bhakatdi, police-station Jharia. | Bhakatdi | Ditto | 1 mile | Ditto | Do. |
| 45. Panrur Kamti mine | Bhaja Dhanji Kachhi | Bhaga, police-station Jharia | Panrur, Kamti | Ditto | 3 miles | Ditto | Do. |
| 46. Bhaga mine | Ditto | Ditto | Bhaga | Ditto | 4 miles | Ditto | Do. |
| 47. Sudamdi mine | Deasi Hirji Kachhi | Sudamdi, police-station Jharia. | Sudamdi | Ditto | 6 miles | Ditto | Do. |
| 48. Sutikdi mine | Mr. Charles Smith | Bhakadi, police-station Jharia. | Sutikdi | Ditto | 5 miles | Ditto | Do. |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **BENGAL PROVINCE—*contd.*** | | | | | | | | |
| **Chota Nagpur Division—*contd.*** | | | | | | | | |
| ***Manbhum District*—concld.** | | | | | | | | |
| 49. Kamartand mine | Nanda Gorain | Chirkunda, police-station Jharia. | Kamartand | Dhanbad Station | 5 miles | Palki or Cart | Coal. | |
| 50. Gopali chak mine | Madheoji Kachhi | Gopali chak, police-station Jharia. | Gopali chak | Ditto | Ditto | Ditto | Do. | |
| 51. Landa mine | Layek Coal Company | Begunia near Barakar | Ladna | Ditto | 4 miles | Ditto | Do. | |
| 52. Madhuban mine | Ditto | Ditto | Madhuban | Ditto | 5 miles | Ditto | Do. | |
| 53. Golakdi mine | Cohen and Company | Golakdi, police-station Jharia. | Golakdi | Ditto | 4 miles | Bullock cart | Do. | |
| 54. Kusunda mine | Bengal-Nagpur Coal Company. | Bhakadi, police-station Jharia. | Kusunda | Ditto | Ditto | Ditto | Do. | |
| 55. Syampur mine | Bengal Stone Company | No. 100, Clive Street, Calcutta. | Syampur | Kalubathan station. | 3 miles | Ditto | Do. | |
| 56. Ditto | Lakhan Mitra | Nirsha, police-station Nirsha. | Ditto | Ditto | 2 miles | Ditto | Do. | |
| 57. Nirsha mine | Ditto | Ditto | Nirsha | Police-station Nirsha. | 1 mile | Ditto | Do. | |
| 58. Igarkar mine | Abinash Rai Pal | Ramnagar, Assansol, district Burdwan. | Igarkar | Barakar | 3 miles | Ditto | Do. | |
| 59. Ditto | Amaljalo Kachhi | Igarpur, police-station Nirsha. | Ditto | Ditto | Ditto | Ditto | Do. | |
| 60. Ditto | Sagen Lal Nagar Kachhi | Ditto | Ditto | Ditto | Ditto | Ditto | Do. | |
| 61. Kalimati mine | Banwari Lal Rai | Barakar | Kalimati | Ditto | Ditto | Ditto | Do. | |
| 1. Gold mine | Messrs. Barry and Company | Bandih | Bandih, Chandil thana, Sadar sub-division. | Chandil, B. N. R. | 14 miles | Ditto | Gold. | |
| 1. Limestone mine | Karali P. Mukherjee | Kutchbell | Pachet Hill, Raghunathpur. | Ramkanali | 5 miles | Ditto | Lime stone. | |
| 2. Stone mine (lime) | Mr. Deveria | Purulia | Hansapathur, Raghunathpur. | Ditto | 8 miles | Ditto | Lime. | |

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|---|---|---|---|---|---|---|---|---|
| 1. *Barmuri* mine | Burn and Company | Raniganj, district Burdwan | Barmuri | Barakar | 3 miles | Ditto | Stone mine. | |
| 2. Madanpur mine | Kinu Mea, and Asraf Mea | Madanpur, Nirsha | Madanpur | Nirsha police-station. | 6 miles | Palki | Ditto. | |
| 3. Jarpahari mine | Bengal Stone Company | No. 100, Clive Street, Calcutta. | Bandar Chuya | Kalubathan station. | 3 miles | Bullock cart | Ditto. | |
| 4. Dalmi stone mine | Birinchi N. Aditya | Dulmi | Dulmi, Chandil thana, Sadar subdivision. | Nimdi, B. N. R. | 6 miles | Ditto | Stone, plate and slabs. | |
| 5. Stone mine | Palu Lal Babu | Bondhu | Bondhu, Chandil thana, Sadar subdivision. | Chandil, B. N. R. | 8 miles | Ditto | Ditto. | |
| Ditto | Akhoy K. Shaw | Gourankocha | Gourankocha, Chandil thana, Sadar sub-division. | Ditto | 10 miles | Ditto | Ditto. | |
| 1. Syampur mine | Bengal Stone Company | No. 100, Clive Street, Calcutta. | Syampur | Kalubathan station. | 3 miles | Ditto | Ghuting and Stone mine. | |
| 2. Kapasara mine | Kanai Lal De | Calcutta | Kapasara, outpost Chirkunda. | Barakar | Ditto | Ditto | Ghuting mine. | |
| 3. Ditto | Ramesh Rai | Chirkunda | Ditto | Ditto | Ditto | Ditto | Ditto. | |
| 4. Ditto | Bhutnath Rai | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. | |
| 5. Ditto | Braja Rai | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. | |

## PALAMAU DISTRICT.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. Palamau | Deby Ram Pandey and others. | Bengal Coal Company, Calcutta. | District Palamau, Chota Nagpur. | Gaya or Arrah. | 80 miles | By palki, or bullock carts. | Coal. | (Not being worked at present.) |

## SINGHBHUM DISTRICT.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. Bengal gold and silver mine, Somij. | Bengal Gold and Silver Company, Limited. | Somij, Gold, Goilkea. Bengal Gold and Silver Mining Company, Limited. | Somij, Porahat, Bengal, Chota Nagpur. | Bengal Nagpur Railway, Monoharpur station. | About 10 miles. | Can be travelled on horse-back. | Gold. | |

# BHAGALPUR DIVISION.

## SONTHAL PARGANAS DISTRICT.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. Domanpur coal mine | Kesab Chandra Dey | Rassickpur, Post Office Dumka, district Sonthal Parganas. | Subdivision Doomka. | Rampurhat | 28 miles, 29 miles. | Hackney, palanquin, or cart. | Coal. | |
| 2. Ghatchora coal mine | | | | | | | | |
| 3. Madankata | Raniganj Coal Association, Limited. | Madankata, Raniganj Coal Association. | Situated on both sides of chord line, East Indian Railway, subdivision Deoghur. | Madhupur or Karmataur. | 10 miles from Madhupur and 6 miles from Karmataur. | Pilot engine, palanquin, bullock or ballast cart. | Do. | |
| 4. Sultanpur | Bemwari lal Kahiraj, and Ram lal Kahiraj. | Sultanpur, Taluk Kendua Kansta, Pargana Kundohit, subdivision Jamtara. | Sub-division Jamtara. | Churulia | 3 miles | Bullock cart | Do. | |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **BHAGALPUR DIVISION—*concld.*** | | | | | | | | |
| **MONGHYR DISTRICT.** | | | | | | | | |
| 1. Pananwan | New Indian Mica Company | 6, Clive Row, Calcutta | Sub-division Jamui. | Nawadih | 4½ miles | Bullock—hackney | Mica. | |
| 2. Charka Pathal in Mahesri | F. T. Christian and Company. | Tisri, Bhurai Post Office, Giridih. | Prospecting in Gadi Mahesri, sub-division Jamui. | Ditto | 12 miles | Horse, or dooly. | Do. | |
| 3. Beyhayet | C. W. F. Buckland, Esq., and Mr. E. M. Floyed. | Nawadih Post Office | Sub-division Jamui. | Ditto | Ditto | Palki, or riding. | Do. | |
| 4. Dahian* | Babu Lal Singh of Khandayech. | Khandayech, sub-division Jamui. | Ditto | Ditto | 10 miles | Dooly, or horse. | Do. | * This mine is said to have been worked since last year only. |
| 1. Kharuckpur hills slate and stone quarries. | Ambler and Company, Lessee, from Raj Darbhanga. | Ambler and Company, lessee, slate works, Bussownee *viâ* Dharhara. | Pargana Khuruckpur | Dharhara station, East Indian Railway, loop line. | 8 miles from railway station | Dooly, or country cart. | Slates for roofing and flooring, and mill stones. | |
| 2. Karee Khan Havalee, Khuruckpur, near Rishikund. | Ditto | Ditto | Ditto | Monghyr | 9 miles | Ditto | Slates only. | |
| **PATNA DIVISION.** | | | | | | | | |
| **GYA DISTRICT.** | | | | | | | | |
| 1. Sapahi mica mine | Babu Dirgopal Lal | Manager, Sapahi mica mine, *viâ* Rajowli Post Office, Gaya. | Sub-division Nawada | Rajowli police-station. | 14 miles | Palki, or riding. | Mica. | |
| 2. Singar mica mine | Owner, Babu Jaimangal Prasad Narain Sing, of Singar. Lessee, Messrs. Christian and Company. | Messrs. Christian and Company, Singar, Rajowli Post Office, Gaya. | Ditto | Ditto | 6 miles | Ditto | Do. | |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine-State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **CENTRAL PROVINCES.** | | | | | | | | |
| **Nagpur Division.** | | | | | | | | |
| *Chanda District.* | | | | | | | | |
| Warora Colliery | Government of India. | Manager, Warora Colliery, Warora, C. P. | Warora sub-division. | Warora Station, Wardha Coal State Railway. | 2 miles | Road, or railway by trolly. | Coal, and Fire Clay. | |
| **Nerbudda Division.** | | | | | | | | |
| *Narsingpur District.* | | | | | | | | |
| Mohpani Colliery | Nerbudda Coal and Iron Company, Limited. | Agent and Manager, Mohpani, *viâ* Gadarwara Station, Great Indian Peninsula Railway. | Gadarwara sub-division. | Gadarwara Station, Great Indian Peninsula Railway. | 12 miles | Railway. Probably by trolly or coal train. | Coal. | |
| **Rewah State.** | | | | | | | | |
| Umaria Colliery | Land owned by Rewah State. Machinery, etc., owned, and Mines worked by Government. | Manager, Central Provinces Collieries, Umaria. | In Rewah State | Umaria Station, Bengal Nagpur Railway. | Nearly 2 miles to pit head. | Railway by trolly. | Coal. | |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral, wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| **PUNJAB PROVINCE.** | | | | | | | | |
| **RAWALPINDI DIVISION.** | | | | | | | | |
| *Jhelum District.* | | | | | | | | |
| 1. Dandot Coal Mine. | Government | ..... | Near Dandot village, Tahsil Pind Dadan Khán. | Khewrah Railway Station. | 4 miles | By means of tramway. | Coal. | |
| 2. Pidh Colliery | Ditto | ..... | Near village Pidh, Tahsil Pind Dadan Khán. | Ditto | 6 miles | By road | Do. | |
| 3. Bhaganwalla Colliery. | Ditto | ..... | Near village Bhaganwalla, Tahsil Pind Dadan Khán. | Haranpur Railway Station. | 10 miles | Ditto | Do. | |
| 4. Khewrah Salt Mine. | Ditto | ..... | Near Khewrah village, Tahsil Pind Dadan Khán. | Khewrah Railway Station. | *Nil* | ..... | Salt. | |
| **DERAJAT DIVISION.** | | | | | | | | |
| *Bannu District.* | | | | | | | | |
| 1. Kalabagh Salt Mines. | Government | ..... | Mouza Kalabagh, Tahsil Isakhel, Sub-division Mianwali. | Mari Railway Station, S. S. Branch, North-Western Railway. | 1½ miles | Camels, or boat. | Salt. | |
| **JULLUNDER DIVISION.** | | | | | | | | |
| *Kangra District.* | | | | | | | | |
| 1. Kohr Iron Mine. | Government | Kohr *vid* Baijnath. | Kothr Kohr | Pathankote, North Western Railway. | 121 miles | Mules, ponies and bullocks. | Iron. | The lease is sold by public auction annually, and fetches about ₹50. |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines-State, Province, Division, Sub-division or District. | A nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | BOMBAY PRESIDENCY. | | | | | |
| | | | A. British Districts. | | | | | |
| | | | *Shikarpur.* | | | | | |
| 1. Sukkar Quarries, Nos. 1 to 24. | Nos. 12, 13 and 17 to 22 belong to Sukkar Municipality. Nos. 1 to 10 and 23, to N. W. P. Railway; and the rest to Military Works Department. | See information in column 2. | Taluka Sukkar . | Nos. 1 to 22 and 24 Sukkar main, No. 23 Sukkar bunder. | Within a mile . | Carts . . . | Limestone. | |
| 2. Rohri and Arore Quarries. | Rohri Municipality and Government. | Ditto . . . . | Taluka Rohri . | Rohri . . . | Rohri 1 mile, Arore 5 miles. | Camel, carts and horses, etc. | Limestones, sandstones and other kinds of sands. | |
| | | | *Ahmednagar.* | | | | | |
| 1. Quarry . . . | Government . . | ..... | Jamkhed, Karjat, Shrigonda Nagar and Parnet. | ..... | ..... | Bullock cart . . | Limestone, and stone metal. | |
| | | | *Poona.* | | | | | |
| 1. Sansar . . . | Forest Department . | Forest Department . . | Indapur Taluka . | Diksál . . . | ..... | Bullock cart . . | Stone metal. | |
| 2. Ghode . . . | Ditto . . . | Ditto . . . | Ambegaon Petha . | ..... | ..... | Ditto . . | Ditto. | |
| 3. Wadad Khurd . . | Ditto . . . | Ditto . . . | Taluka Sirur . . . | Talegaon . . | 5 miles . . | Ditto . . | Ditto. | |
| 4. Khadki . . . | P. W. Department . | P. W. Department . . | Taluka Bhimthadi | Bori . . . | 8 do. . . | Ditto . . | Ditto. | |
| 5. Padir . . . | | | | Kedgaon . . | 8 do. . . | Ditto . . | Ditto. | |
| 6. Walki . . . | Nanaji constructor . | ..... | Petha Dhond . . | Dhond . . . | 3 do. . . | Ditto . . | Ditto. | |
| 7. Dhond . . . | Nathuram . . | ..... | Ditto . . | Do. . . . | 3 do. . . | Ditto . . | Ditto. | |
| 8. Delavdi . . . | Kesukushaba . . | ..... | Ditto . . | Do. . . . | 3 do. . . | Ditto . . | Ditto. | |
| 9. Phursangi . . | Amrita and others . | ..... | Taluka Haveli . | Phursangi . . | 1½ do. . . | Ditto . . | Ditto. | |
| | | | *Hyderabad.* | | | | | |
| 1. Fuller's Earth Mine . | Government . . | Government . . . | T. Hyderabad, Hala Sub-division. | Hyderabad . . | 4 miles . . | By road . . | Fuller's earth. | |
| | | | *Panch Mahals.* | | | | | |
| 1. Quarry . . . | Government . . | ..... | Bajarwada in Jhalod Petha. | Limkheda on Godhra-Ratlam line. | 23 miles . . | Bullock cart . . | Dark-bluish-coloured soft stone slates. | It is used for building purposes. Annually leased. |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | BOMBAY PRESIDENCY—*contd.* | | | | | |
| | | | B. Native States. | | | | | |
| | | | *Cutch.* | | | | | |
| 1. Bhuj Quarries, 11 in number. | Cutch State . . | Cutch State . . . | Bhuj . . . | ..... | ..... | Carts or donkeys . | Black stones, red stones, limestones, sandstones and hard flat laminated stones. | |
| 2. Mandvi Quarries, 6 in number. | Ditto . . . | Ditto . . . . | Nabhai, Mandvi, Goniarsar and Bhadai. | ..... | ..... | Ditto . . | White stone. | |
| 3. Andhakni Quarry . | Ditto . . . | Ditto . . . . | Khávda . . | ..... | ..... | Carts . . . | Ditto. | |
| 4. Baryani . . | Ditto . . . | Ditto . . . . | Mundra . . . | ..... | ..... | Do. . . . | Ditto. | |
| 5. Bhadresarni . . | Ditto . . . | Ditto . . . . | Ditto . . . | ..... | ..... | Do. . . . | Ditto. | |
| 6. Navinal . . . | Ditto . . . | Ditto . . . . | Ditto . . . | ..... | ..... | Do. . . . | Ditto. | |
| 7. Mathak . . . | Ditto . . . | Ditto . . . . | Anjore . . . | ..... | ..... | Do. . . . | Ditto. | |
| 8. Parjan . . . | Ditto . . . | Ditto . . . . | Abdusha . . | ..... | ..... | Do. . . . | Reddish stone. | |
| 9. Jukhan . . . | Ditto . . . | Ditto . . . . | Jukhan . . . | ..... | ..... | Do. . . . | White stone. | |
| | | | *Kathiawar.* | | | | | |
| 1. Lakhtar Quarries, 5 in number. | Lakhtar State . . | Lakhtar State . . . | Lakhtar . . | Thán . . . | Within 2 miles . | Bullock carts . . | Building stones, and crude coals. | |
| 2. Wadwhan Quarries, 9 in number. | Wadwhan State . . | Wadwhan State . . | Wadwhan . . | Wadwhan and Wadwhan Junction. | „ 5 „ . | Ditto. . . | White and red stones | |
| 3. Saila Quarry . . | Saila State . . . | Saila . . . . | Saila . . . | Thán and Dholia . | 4 and 8 miles respectively. | Ditto . . | Sandstone and clay. | |
| 4. Muli . . . | Muli State . . . | Muli State . . . | Muli . . . | Muli Station . . | 3 miles . . | Ditto . . | Red sand stone. | |
| 5. Datha . . . | Share-holders of Datha and Jali and Bambhor. | Datha State . . . | Datha . . . | Bhawnagar . . | 50 „ . . | Ditto . . | White gray stones. | |
| 6. Chámardi . . | Chámardi Talukdars . | Chámardi Talukdars . | Chámardi . . | Sihor and Songad . | 10 „ . . | Ditto . . | Ditto. | |
| 7. Dhángadhra, 43 Quarries. | Dhángadhra State . | Dhángadhra . . . | Jhalévád Sub-division | Wadwhan, Khara, Godha, Lakhtar and Morvi. | Within 50, 23, 20 and 28 miles. | Ditto . . | Grinding and building stones. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | *Palanpur State.* | | | | |
| 1. Palanpur State Quarries, 5 in number. | Palanpur State . . | The Dewansahib of Palanpur. | Palanpur State . | Sarotri on R. M. Railway. | Within 18 miles | Carts . . . | Granite stones. |
| 2. Wáo State, 2 Quarries | Swámi (Saint) and Rana of Wáo. | Dodgam Swámi and Rana of Wáo. | Wáo . . . | Deesa . . . | „ 45 „ | Camel, and country carts. | Clay and chunam. |
| 3. Santhalpore, 4 Quarries. | Jodeji Sámer Kanji, Thakore Rawji, and others. | Santhalpore . . . | Santhalpore . . | Patdi and Pattun . | „ 60 „ | Bullock carts . . | White and red clay, and building stones. |
| | | | *Mahikántha.* | | | | |
| 1. Idar, 7 Quarries . | The Máharaja of Idar . | The Maharaja of Idar . | Ahmednagar and Vadáli. | Vadnagar . . | Within 48 miles | Country carts . | Sand and limestones. |
| 2. Salvekántha . . | Thakore of Khedawáda . | Thakore of Khedawáda . | Khedawáda . . | Ditto . . . | 24 miles . . | Carts, and camels . | Sandstones. |
| 3. Ilol . . . | The Thakore of Ilol . | The Thakore of Ilol . . | Ilol . . . | Ditto . . . | 20 „ . . | Carts . . . | Ditto. |
| | | | *Rewakántha.* | | | | |
| 1. Rajpipla Quarries, 4 in number. | Rajpipla State . . | Rajpipla . . . . | Rajpipla State . | Ankleshwar on B. B. and C. I. Railway | 16 miles . . | Bullock carts . . | Akik stones. |
| 2. Wadasinor . . | Nabob of Wadasinor . | Wadasinor . . . | Dongrali in Wadasinor. | Sewalia . . . | 10 „ . . | Ditto . . | Building stones. |
| 3. Sunth . . . | Sunth Darbar . . | Sunth . . . . | Valai river in Sunth. | Sunth road . . | 37 „ . . | Ditto . . | Ditto do., ordinary. |

NOTE.—Returns for the Districts and States besides those shown in the return are blank.

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral, wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | MADRAS PRESIDENCY. | | | | | |
| | | | *Godavari District.* | | | | | |
| 1. Rajahgompalli coal mines. | The Godávari Coal Company, Limited. | Rajahgompalli, *vid* Wudagudiem, Godávari District. | Bhadrachalam Taluk | Rajahmundry, East Coast Railway. | Eighty (80) miles | Boat up the river Godávari. | Coal | The Company is only working under prospecting licenses and a mining lease has not yet been granted. |
| | | | *Nellore District.* | | | | | |
| 1. Pokkandala | Messrs. Kudah Badusha and Hadi Badusha Company, Madras. | Gulam Dastagir Sahib, Manager of the Company, residing in Korchi Konda in Gokula Brindavanam Shrotriem, *vid* Sythapuram Post. | Pokkandala Shrotriem. | Gudur Railway Station, South Indian Railway. | Ten (10) miles | Road up to Sythapuram for seven miles and thence cart-track for three miles. | Mica. | |
| 2. Chaganam | Ditto | Ditto | Chaganam No. 1 unoccupied waste. | Ditto | Ditto | Road up to Chaganam for 12 miles and thence by cart-track for two miles. | Do. | Only prospecting. |
| 3. Turupu Bundla | Ditto | Ditto | Turupu Bundl, Forest Reserve No. 1. | Ditto | Six (6) miles | Road up to Tippavarapad for five miles and thence by cart-track for two miles. | Do. | Ditto. |
| 4. Utukur | K. Munisami Iyer of Madras. | K. Munisami Iyer, owner of Mica mine in Utukur, *vid* Sythapuram Post. | Utukur Survey No. 137. | Ditto | Thirteen (13) miles. | Road up to Sythapuram for seven miles and bandy-track for six miles. | Do. | |
| | | | *North Arcot District.* | | | | | |
| 1. The Mysore Reefs Gold mines. | The Mysore Reefs Gold Mining Company, Limited. | John Garland, Esq., Secretary, Mysore Reefs Gold Mining Company, No. 6 Queen's Street Place, London. | Athinathan, Kangundi Zemindari, Vellore Sub-division. | Bisanatham Station, Bangalore Branch, Madras Railway, South-west line. | About 1½ miles | Bisanatham is only a trial station. There are no villages within a radius of one mile. Bandies or any other kind of conveyances are not available at the station. If previous arrangements are made for country carts, they may be had at times. | Gold quartz. | The best way is to go *vid* the Kolar gold mines.—J. G. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *Anantapur District.* | | | | |
| 1. Diamond mine . . | | Mr. Wilkins, Agent, Diamond Company, Wajrakarur. | Diamond Company at Wajrakarur. | Wajrakarur, Gooty Taluk. | Six miles from Gulapalien Railway Station, Southern Mahratta Railway, or 10 miles from Guntakal junction. | Six miles from Gulapaliem, or ten miles south of Guntakal. | Common country carts on hire. | Diamonds. |
| | | | | TRAVANCORE. | | | | |
| | | | | TRIVANDRUM DIVISION. | | | | |
| 1. Vellanard mines. | Plumbago | Parry and Company. . | J. E. Fowler, Esq., Agent to Messrs. Parry and Company, Vellanard, Nedumangad, Trivandrum. | Valiara Moory Uzhamalakal Adhigaranu, Nedumangad Taluk. | There is no Railway station. The mine is in proximity to the place where the road from Nedumangad meets at Vellanard. | There is a distance of half a mile from the place where the Nedumangad road meets at Vellanard; the mines are about 5 miles distant from Nedumangad. | From the place where the Nedumangad meets at Vellanard, there is a public road leading to the mine. | Plumbago. |
| | | | | *Visagapatam District.* | | | | |
| 1. Kodur mines. | Manganese | The Maharajah of Vizianagram and others. | Henry J. Emison, Manager, Kodur mines. | Kodur near Cheepurupalli. | Garividi Station, East Coast Railway. | About one mile . | Carts . . . . | Manganese. |

| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral, wrought. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | | | ASSAM. | | | | | |
| | | | *Naga Hills District.* | | | | | |
| 1. Dikhu Valley . . | Assam Tea Company . | Nazira, Assam . . . | Sub-division Mokokchang. | Dekhu and Sessang Mukhs. | 30 miles . . | Road and river to within 5 miles of Mine. | Coal. | |
| | | | *Lakhimpur District.* | | | | | |
| 1. Tikok . . . | Assam Railways and Trading Company, Limited. | Tekok . . . | Tekok and Ledo Hills near Margherita, Sadr Sub-division. | Dihing Bridge Railway Station at Margherita. Colliery line runs to Mines. | Tikok, 6 miles, | By rail . . . | Coal. | |
| 2. Ledo . . . | | Ledo . . . | | | Ledo, 8 miles . | | | |
| | | | *Khasi and Jaintia Hills Districts.* | | | | | |
| 1. Shella . . . | The people of Shella . | Shella . . . . | Shella, Khasi Hills . | Chhattak, Sylhet . | About a day's journey. | By boats during rains, by road in winter. | Limestone. | |
| 2. Dholai Cherra . | Habib Ulla . . . | Sylhet . . . . | State Bhowal, Khasi and Jaintia Hills. | Sunamganj, Sylhet | Ditto . | Ditto . | Do. | |
| 3. Patharia . . . | | | | | | | | |
| 4. Bhowal Cherra . | | | | | | | | |
| 5. Langrin . . . | Messrs. Inglis & Co. . | Chhattak, Sylhet . . | State Langrin, Khasi and Jaintia Hills. | Ditto . | Ditto . | Ditto . | Do. | |
| 6. Nongstoin . . . | Ditto . | Ditto . . | State Nongstoin, Khasi and Jaintia Hills. | Ditto . | Ditto . | Ditto . | Do. | |
| 7. Borpunji . . . | Babu Jeebon Roy . . | Cherrapunji . . . | Borpunji, Khasi and Jaintia Hills. | Thariaghat . . | About 3 miles . | Ditto . | Do. | |
| 8. Sohbár . . . | Messrs. Don, Roy & Co. | Ditto . . . | Sohbarpunji, Khasi and Jaintia Hills. | Ditto . | About 1 mile . | By road . . . | Do. | |
| | „ Inglis & Co. . | Chhattak, Sylhet . . | | | | | | |

## UPPER BURMA.

### NORTHERN DIVISION.

*Shwebo District.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Letkokbin Colliery | Burma Coal Company, "Limited." | Kabwet, Shwebo District | Tantabin Sub-division. | Kabwet is the nearest riverine station, and Kinu the nearest railway station. | From Kabwet 4 miles, and from Kinu 8 miles. | From Kinu to Kabwet by horse or cart, thence by Company's steam tramway. The direct route from Mandalay is by the Irrawaddy Flotilla Company's steamers. | Coal. |

*Ruby Mines District.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Pingntaung Mines<br>2. Punma Workings<br>3. Tagaungnandaing<br>4. Mogôk Shweboutha Mines. | Burma Ruby Mines Company, "Limited." | Agent to the Burma Ruby Mines Company, Kyatpin. | Mogôk Sub-division. | Thabeikkyin riverine station accessible by steamer. | 52 miles | By carts, mules and ponies | Precious stones, chiefly rubies, spinels and sapphires. |

## II.—*List of Mines not working in December 1894.*

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mines—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral, wrought. | Remarks. (Nearest Thána, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **BENGAL PROVINCE.** | | | | | |
| | | | | BURDWAN DIVISION. | | | | | |
| | | | | *Burdwan District.* | | | | | |
| 1 | Chowka | Joint Stock Company | Manager, Joint Stock Co.'s Chowka Mine, Raniganj, E. I. Ry. | Raniganj Sub-division. | Raniganj | 5 miles | By carriage | Coal | Raniganj. |
| | | | | CHOTA NAGPUR DIVISION. | | | | | |
| | | | | *Palamau District.* | | | | | |
| 1 | Singra | Messrs. Rodford and Hodges. | ..... | ..... | Gya, about 92 miles *vid* Imamganj, Manatu and Daltonganj. | 92 miles | Steamer from Arrah to Dehra, then by palki 72 miles, *vid* Aurangabad to Daltonganj. | Coal | Daltonganj, 5 miles. |
| 2 | Rajhara | Bengal Coal Company | ..... | ..... | Gya, about 100 miles *vid* Aurangabad. | 100 „ | Ditto | Do. | Do., 12 miles. |
| | | | | *Singhbhoom District.*— | | | | | |
| 1 | Rajdoha | Rajdoha Mining Co., Ld. | ..... | ..... | Kandra, B. N. Ry. | 24 miles | There is a drivable road between Rajdoha and Kandra. | Copper | Ghatsilla, out post Assanboni. |
| | | | | MADRAS PRESIDENCY. | | | | | |
| | | | | *Nellore District.* | | | | | |
| 1 | Uturkur | K. Munisami Iyer, of Madras. | K. Munisami Iyer, Owner, Uturkur *vid* Sythapuram Post. | Nos. 292 and 294 unoccupied assessed and unassessed land, respectively. | Gudur, S. I. Ry. | 13 miles | By road up to Sythapuram for 7 miles, and bandy track for 6 miles. | Mica | ..... |
| | | | | ASSAM. | | | | | |
| | | | | *Lakhimpur District.* | | | | | |
| 1 | Tirap | Assam Railways and Trading Co., Ld. | Manager, Assam Railways and Trading Co.'s Tirap and Namdang Mines, Tirap and Namdang. | Tirap and Namdang Hills, not very far from Tikak and Ledo Mines. | Dihing Bridge Railway Station at Margherita. Colliery line runs to Mine. | 11 miles | By rail | Coal | These Mines are not worked at present, but the owners are engaged in laying out works for the purpose. |
| 2 | Namdang | | | | | 9 „ | | | |
| | | | | *Jaintia Hills District.* | | | | | |
| 1 | Lakadong | R. R. Waller, Esq., 5, Lyons' Range, Calcutta. | ..... | Lakadong | Barghat | 32 miles | By road to Jowai | Coal | |

12. *Special matters or Statements from Returns received.*

| No. | Name of District, etc. | Particulars. | Remarks. |
|---|---|---|---|
| | BENGAL. | | |
| 1. | Chota Nagpur Division, Hazaribagh District, Giridih Sub-Division. | 56 out of 208 mica pits and mines have submitted returns. | |
| 2. | Chota Nagpur Division, Manbhum District. | 23 Coal and one Clay out of 76 mines have submitted returns. | |
| 3. | Assam . . | The mines in the Lakhimpur and Naga Hills Districts only are being worked. No mines were started or abandoned during the half-year ended 31st December 1894. | There are lime quarries in the southern slopes of the Khasi Hills, but these are not included in the returns, being merely surface diggings. |
| 4. | Burma . . | No mines were started or abandoned during the half year ended 31st December 1894. | |
| 5. | N.-W. P. & Oudh. | No mines working in these Provinces at present. | |
| 6. | Punjab . . | No mines started or abandoned during 1894. | There are kankar and lime quarries and petroleum borings in this Province, but these are not included in the returns,—the quarries being only a few feet deep. |
| 7. | Kashmír . . | No mines were worked in the Kashmír Province during the year 1894. | |
| | BOMBAY PRESIDENCY. | | |
| 8. | Baroda Territory. | There are no mines in this Territory. | There are lime and stone quarries in this Presidency, for which Forms No. 23 and 26 have been submitted, 24 and 25 being blank. |
| 9. | Hyderabad Assigned Districts. | No mines were worked during 1894 in these Districts. | |
| 10. | Ajmere-Mewara. | No mines were at work in this District during 1894. | |
| 11. | Hyderabad (Deccan), Linsugur District. | Only prospecting for gold; no lodes found. | |
| | MADRAS PRESIDENCY. | | |
| 12. | Anantapur District. | Only prospecting for diamonds; no mining operations performed. | |
| 13. | Godavari District. | Prospecting for coal. | |

*Special matters or Statements from Returns received*—contd.

| No. | Name of District, etc. | Particulars. | Remarks. |
|---|---|---|---|
| | MADRAS PRESIDENCY—*contd.* | | |
| 14. | Nellore District. | Besides the soapstone and mica mines, there are also prospecting operations being carried on. | |
| 15. | Chingleput and Salem Districts. | There are some boreholes made for prospecting purposes. | |
| 16. | Coorg . . | No mines in this Province. | |
| 17. | Balasore in Orissa. | There are eight stone quarries, but they have all been abandoned. | |

NOTE.—It is unfortunate that full, reliable, and recent returns of the coal mines in Bengal have not been received; I believe I am quite right in saying that these were the least satisfactory part of the returns; and I have had an immense amount of trouble to make out what I hope is an approximately accurate list.

## 13.—PARTICULARS OF INDIAN MINES.

The next following tables of statements are intended to give information in a compact and convenient form for reference, for the year ending the 31st December 1894, as to:—

1. The total number of mines in India, as nearly correct as I have been able to get the information.
2. The different kinds of materials being mined, and the number of mines being worked for each kind of material.
3. The total mines, and the number for each material in the various provinces, districts, and divisions.
4. The weights of the various materials wrought, partly in the dressed, and partly in the undressed state.
5. The number of persons employed, distinguishing those employed aboveground and belowground, also males and females.

The particulars may be in some respects not quite accurate. For instance, I have not the means of knowing whether the figures representing the number of mines do in all cases represent mines, or whether they only represent pits, or sections of mines in some cases.

### Definition of mine:—

The definition given to show what was meant by the word mine was as follows:—"The term mine may include all parts that are connected together belowground, belong to the same owner, and are ordinarily described by the same name."

### Other particulars:—

Other tables following give particulars of the deaths and other serious accidents at mines in India during the year 1894.

# MINES IN INDIA.

*Number of mines for each mineral in each District, compiled from the Returns of Form 23.*

| No. | Districts, etc. | Coal. | Salt. | Mica. | Fire-clay. | Totals. |
|---|---|---|---|---|---|---|
| | **Bengal.** | | | | | |
| 1 | Raniganj | (a) 67 | ... | ... | ... | 67 |
| 2 | Bankura | (b) 3 | ... | ... | ... | 3 |
| 3 | Santhal Parganas | 4 | ... | ... | ... | 4 |
| 4 | Giridih | 38 | ... | 51 | ... | 89 |
| 5 | Manbhum | 23 | ... | ... | (c) 1 | 24 |
| 6 | Monghyr | ... | ... | (i) 2 | ... | 2 |
| 7 | Gya | ... | ... | 3 | ... | 3 |
| | Total | 135 | ... | 56 | 1 | 192 |
| | **Central Provinces.** | | | | | |
| 8 | Chanda District (Warora.) | 1 | ... | ... | 1 | 2 |
| 9 | Narsinghpur District, (Mohpani). | 3 | ... | ... | ... | 3 |
| 10 | Rewah State (Umaria) | 1 | ... | ... | ... | 1 |
| | Total | 5 | ... | ... | 1 | 6 |
| | **Punjab.** | | | | | |
| 11 | Jhelum District | 9 | 2 | ... | ... | 11 |
| | **Beluchistan.** | | | | | |
| 12 | Beluchistan | 14 | ... | ... | ... | 14 |
| | **Bombay Native States.** | | | | | |
| 13 | Kathiawar | 1 | ... | ... | ... | 1 |
| | **Hyderabad (Deccan.)** | | | | | |
| 14 | Yellandu-Singareni | 4 | ... | ... | ... | 4 |
| | **Madras.** | | | | | |
| 15 | Godavari | (d) 1 | ... | ... | ... | 1 |
| 16 | Nellore | ... | ... | 10 | ... | 10 |
| | Total | 1 | ... | 10 | ... | 11 |
| | **Assam.** | | | | | |
| 17 | Lakhimpur | 3 | ... | ... | ... | 3 |
| 18 | Naga Hills | (e) 1 | ... | ... | ... | 1 |
| | Total | 4 | ... | ... | ... | 4 |
| | **Burma (Upper).** | | | | | |
| 19 | Shwebo | 1 | ... | ... | ... | 1 |
| | **Kashmir.** | | | | | |
| 20 | Ladaleh District | ... | 1 | ... | ... | 1 |
| | Totals | 174 | 3 | 66 | 2 | 245 |

| No. | Districts, etc. | Lime-stone. | Stone. | Slate. | Plum-bago. | Man-ganese. | Gold. | Rub-ies. | Sap-phires. | Spinels. | Soap Stone. | Fuller's earth. | Borax. | ? | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Bengal.** | | | | | | | | | | | | | | |
| 21 | Monghyr | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| 22 | Singhbhum | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| | Total | ... | ... | 2 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 3 |
| | **Bombay British States.** | | | | | | | | | | | | | | |
| 23 | Panch Mahals | ... | ... | (f) 7 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| 24 | Sikarpur | 24 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 | ... | ... | 32 |
| | Total | 24 | ... | 7 | ... | ... | ... | ... | ... | ... | ... | 8 | ... | ... | 39 |
| | **Bombay Native States.** | | | | | | | | | | | | | | |
| 25 | Cutch | 1 | 22 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 23 |
| 26 | Mahikantha | 10 | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 30 |
| 27 | Rewakantha | ... | (g) 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| 28 | Sindh States | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | (h) 1 | ... | ... | 1 |
| | Total | 11 | 46 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 58 |
| | **Hyderabad (Deccan).** | | | | | | | | | | | | | | |
| 29 | Raichur | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | 3 |
| 30 | Linsugur | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| | Total | ... | ... | ... | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | 4 |
| | **Madras.** | | | | | | | | | | | | | | |
| 31 | Vizagapatam | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 32 | North Arcot | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| 33 | Nellore | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 |
| | Total | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | 1 | ... | ... | ... | 3 |
| | **Travancore.** | | | | | | | | | | | | | | |
| 34 | Vellanad | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| | **Burma (Upper).** | | | | | | | | | | | | | | |
| 35 | Kyatpyin and Mogôk Ruby Mine District, Upper Burma. | ... | ... | ... | ... | ... | ... | (j) 1 | (j) 9 | (j) 2 | ... | ... | ... | ... | 12 |
| | **Kashmir.** | | | | | | | | | | | | | | |
| 36 | Ladaleh District | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | 2 |
| | Totals | 35 | 46 | 9 | 1 | 1 | 6 | 1 | 9 | 2 | 1 | 9 | 1 | 1 | 122 |
| | | | | | | | | | | | | | | | 245 |
| | | | | | | | | | | | | GRAND TOTAL | | | 367 |

(a) Form No. 23 submitted for 46 mines only.

(b) One not worked during 1894.

(c) Clay.

(d) Two trial pits only.

(e) Dug out from surface.

(f) Pits.

(g) Quarries.

(h) Red earth called "Met."

(i) Information regarding some not available.

(j) Includes open casts.

? Mineral uncertain, it was called "Pholi."

Note 1.—It is uncertain as to how many of the figures represent complete mines, and how many represent parts only, such as sections of mines worked by separate shafts or inclines.

Note 2.—A return supplied in February 1894 gave reference to 208 Mica mines in Bengal.

*Particulars collected from the Returns of Form No. 23.*

| No. | Number of mines. | Names and description of minerals wrought. | Weight wrought in tons. Dressed. | Weight wrought in tons. Undressed. | Number of persons employed at each kind of mine. Above ground. Males. | Above ground. Females. | Total above ground. | Below ground. Males. | Below ground. Females. | Total below ground. | Total above and below ground. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | *Note.*—Where the number of persons were given for the year, they have been divided by 300, the estimated number of working days in a year. |
| 1 | | BENGAL. | | | | | | | | | | |
| | 18 | Coal | 707,532 | ..... | 825 | 545 | 1,370 | 170 | 45 | 215 | 1,585 | |
| 2 | | | | | 247,470 | 163,717 | 411,187 | 51,241 | 13,459 | 64,700 | 475,887 | Yearly number. |
| | 95 | ,, | ..... | Tons. cwt. 1,063,356 4 | 3,201 | 2,268 | 5,469 | 6,699 | 2,142 | 8,841 | 14,310 | |
| | | | | | 960,404 | 680,557 | 1,640,961 | 2,009,898 | 642,522 | 2,652,420 | 4,292,381 | Yearly number. |
| | | | TOTAL . 1,770,888 | | | | | | | | | |
| | | BELUCHISTAN. | | | | | | | | | | |
| | | | T. cwt. qrs. lbs. | | | | | | | | | |
| 3 | 12 | Coal | 22,068 8 0 20 | ..... | 300 | ... | 300 | 809 | ... | 809 | 1,109 | |
| 4 | 1 | ,, | ..... | 2,500 | 5 | ... | 5 | 30 | ... | 30 | 35 | |
| | | | *Dressed and undressed.* T. cwt. qrs. lbs. | | | | | | | | | |
| 5 | 1 | ,, | 185 3 2 22 | | 20 | ... | 20 | 20 | ... | 20 | 40 | |
| | | | TOTAL . 24,753 | | | | | | | | | |
| | | MADRAS. | | | | | | | | | | |
| | | | T. cwt. | | | | | | | | | |
| 6 | 1 | Coal | 1,337 4 | ..... | 75 | 7 | 82 | 57 | ... | 57 | 139 | |
| | | BURMA. | | | | | | | | | | |
| | | | T. cwt. | | | | | | | | | |
| 7 | 1 | Coal | 12,367 14 | ..... | 91 | 45 | 136 | 59 | 40 | 99 | 235 | |
| | | ASSAM. | | | | | | | | | | |
| | (a) | | | | | | | | | | | |
| 8 | 1 | Coal | ..... | T. cwt. qrs. lbs. 33 17 3 3 | Number employed not stated in Return. | | | | | | | (a) Dug out from surface. |
| | | | *Whether dressed or undressed was not stated.* | | | | | | | | | |
| 9 | 3 | ,, | 170,264 | | 223 | 123 | 346 | 471 | 228 | 699 | 1,045 | |
| | | | TOTAL . 170,298 | | | | | | | | | |
| | | CENTRAL PROVINCES. | | | | | | | | | | |
| | (b) | | | T. cwt. | | | | | | | | |
| 10 | 5 | Coal | ..... | 273,331 2 | 481 | 79 | 560 | 2,059 | 169 | 2,228 | 2,788 | (b) Includes one for fire clay also. |
| | | PUNJAB. | | | | | | | | | | |
| | | | | T. | | | | | | | | |
| 11 | 9 | Coal | ..... | 66,467 | 71 | 1 | 72 | 50 | 1 | 51 | 123 | |
| | | | | | 21,291 | 279 | 21,588 | 14,846 | 31 | 14,877 | 36,465 | Yearly number. |
| | | HYDERABAD (DECCAN). | | | | | | | | | | |
| | | | T. cwt. qrs. | | | | | | | | | |
| 12 | 4 | Coal | 240,524 16 2 | | 627 | 45 | 672 | 3,061 | 626 | 3,687 | 4,359 | |
| | | BOMBAY (NATIVE STATE). | | | | | | | | | | |
| | (c) | | | | | | | | | | | |
| 13 | 1 | Coal | ..... | ..... | No record kept of quantity nor of persons employed. | | | | | | | (c) Surface coal. |
| | | BENGAL. | | | | | | | | | | |
| | | | T. cwt. qr. lbs. | | | | | | | | | |
| 1 | 17 | Mica | 51 5 1 7 | ..... | 145 | 205 | 350 | 165 | ... | 165 | 515 | |
| 2 | 39 | ,, | ..... | T. cwt. qrs. lbs. 373 3 3 3 | 54 | 65 | 119 | 160 | 85 | 245 | 364 | |
| | | | | | 16,310 | 19,393 | 35,703 | 48,020 | 25,605 | 73,625 | 109,328 | Yearly number. |
| | | | TOTAL .. 424 | | | | | | | | | |
| | | MADRAS. | | | | | | | | | | |
| | | | T. cwt. qrs. lbs. | | | | | | | | | |
| 3 | 10 | Mica | 19 9 2 10 | ..... | 25 | 9 | 34 | 526 | 282 | 808 | 842 | |

*Particulars collected from the Returns of Form No. 23*—contd.

| No. | Number of mines. | Names and description of minerals wrought. | Weight wrought in tons. | | Number of persons employed at each kind of mine. | | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Above ground. | | Total above ground. | Below ground. | | Total below ground. | Total above and below ground. | |
| | | | Dressed. | Undressed. | Males. | Females. | | Males. | Females. | | | |
| | | **Bengal.** | | | | | | | | | | |
| 1 | 1 | Gold | ..... | 1,000 gold quartz. ozs. dwts. 99 4 gold. | 30 | 90 | 120 | 107 | ... | 107 | 227 | |
| | | **Hyderabad (Deccan).** | | | | | | | | | | |
| 2 | 1 (*d*) | Gold | ..... | T. cwt. 260 10 of gold quartz. | 210 | 190 | 400 | 98 | ... | 98 | 498 | |
| 3 | 3 | „ | ..... | *Nil* | 110 | 179 | 289 | 122 | ... | 122 | 411 | (*d*) Chiefly prospecting, did not crush any quartz. |
| | | **Madras.** | | | | | | | | | | |
| 4 | 1 | Gold | ..... | ozs. dwt. 324 3 gold. | 162 | 30 | 192 | 120 | ... | 120 | 312 | |
| | | **Punjab.** | | | | | | | | | | |
| 1 | 2 | Salt | ..... | T. cwt. qrs. lbs. 90,028 11 3 14 | 60 | ... | 60 | 361 | 301 | 662 | 722 | |
| | | **Kashmir.** | *Whether dressed or undressed was not stated.* | | | | | | | | | |
| 2 | 1 | Salt | T. cwt. qr. lb. 2 19 1 1 | | Number of persons employed not stated. | | | | | | | |
| | | **Bengal.** | *Dressed and undressed.* | | | | | | | | | |
| 1 | 2 | Slate | 500 | | 75 | 115 | 190 | ... | ... | ... | 190 | |
| | | **Bombay.** | | | | | | | | | | |
| 2 | 1 (*e*) | Slate | ..... | 5,174 | 75 | ... | 75 | ... | ... | ... | 75 | (*e*) 7 Pits. |
| | | **Bombay (British States).** | *Dressed and undressed.* | | | | | | | | | |
| 1 | 24 | Limestone. | 2,190 | | No record kept of number of persons employed. | | | | | | | |
| | | **Bombay (Native States).** | *Whether dressed or undressed was not stated.* | | | | | | | | | |
| 2 | 1 | Limestone. | 530 (soft) | | 6 | ... | 6 | ... | ... | ... | 6 | |
| 3 | 10 | „ | 1,675 (common) | | 15 | 3 | 18 | 37 | 6 | 43 | 61 | |
| | | **Bombay (Native States.** | *Whether dressed or undressed was not stated.* | | | | | | | | | |
| 1 | (*f*) 4 | Stone | 558 | | 64 | 32 | 96 | 64 | ... | 64 | 160 | (*f*) Quarries. |
| 2 | 22 | „ | 2,120 (hard) | | 929 | ... | 929 | 2,640 | ... | 2,640 | 3,569 | |
| 3 | 1 | „ | 1,125 (soft) | | 17 | ... | 17 | ... | ... | ... | 17 | |
| 4 | 18 | „ | 3,016 (common) | | 30 | 7 | 37 | 63 | 15 | 78 | 115 | |
| 5 | 1 | | 20 (not good) | | 80 | 20 | 100 | ... | ... | ... | 100 | |
| | | **Bombay (British States).** | 1341 (pure) | | | | | | | | | |
| 1 | 8 | Fuller's Earth. | | | ... | ... | ... | 30 | ... | 30 | 30 | |
| | | **Bombay (Native States).** | | | | | | | | | | |
| 1 | 1 | Red Earth called "Met" | ..... | 14 | ... | ... | ... | 13 | ... | 13 | 13 | |
| | | **Bengal.** | | | | | | | | | | |
| 2 | 1 | Clay | *Quantity not stated.* | | ... | ... | ... | 10 | 6 | 16 | 16 | |

*Particulars collected from the Return of Form No. 23*—contd.

| No. | Number of mines. | Names and description of minerals wrought. | Weight wrought in tons. | | Number of persons employed at each kind of mine. | | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Above ground. | | Total above ground. | Below ground. | | Total below ground. | Total above and below ground. | |
| | | | Dressed. | Undressed. | Males. | Females | | Males. | Females. | | | |
| | | **Madras.** | | | | | | | | | | |
| 1 | 1 | Manganese | 11,000 T. cwt. qrs. lbs. | ..... | Number of persons employed vary from 600 to 1,100 according to season, one-half being females. | | | | | | | |
| 1 | 1 | Soap stone | 53 6 2 18 | ..... | ... | ... | ... | 40 | .. | 40 | 40 | |
| 1 | 1 | Plumbago . | ..... | T. cwt. qrs. lbs. 1,597 12 3 4 | 25 | 82 | 107 | 130 | ... | 130 | 237 | |
| | | **Burma.** | | | | | | | | | | |
| 1 | (g) 1 | Ruby . | *Dressed to marketable condition.* Carats. 38,667 | ..... | 378 | ... | 378 | 146 | ... | 146 | 524 | (g) Includes open casts. |
| 2 | (g) 9 | Sapphires . | | | | | | | | | | |
| 3 | (g) 2 | Spinels . | | | | | | | | | | |
| | | **Kashmir.** | *Whether dressed or undressed was not stated.* | | | | | | | | | |
| 1 | 1 | Borax . | T. cwt. qrs. lbs. 73 6 3 23 | | 39 | ... | 39 | ... | ... | ... | 39 | |
| | | | | | 11,616 | ... | 11,616 | ... | ... | ... | 11,616 | Yearly number. |
| 2 | 1 | Pholi(?) . | T. cwt. qrs. lbs. 29 17 3 12 | | Number of persons employed was not stated. | | | | | | | |

## RETURNS.

### Forms of returns—

The information given in the foregoing statements and in others that follow, was received from the various districts on forms that I had numbered 23, 24, 25, and 26, for my own convenience. As to Forms 23, 24 and 25, these were sent by the Under-Secretary to the Government of India, Department of Revenue and Agriculture, on the 21st February 1895, along with Circular No. $\frac{3}{23}$, to—

The Secretary to the Government of Madras.
" " " Bombay,
" " " Bengal.
" " " The N.-W. P. and Oudh.
" " " The Punjab.
The Chief Commissioner of the Central Provinces.
" " " Burma.
" " " Assam.
" " " Coorg.
" " " Ajmere-Merwara.
The Resident of Hyderabad.

Form 26 had been similarly issued on the 6th November 1894, along with Circular No. $\frac{13}{11}$ asking "that information may be sent half-yearly of any mines started or abandoned in ".

Absolute correctness can scarcely be expected at the commencement of collecting information that had not been hitherto kept, and when first making returns on mining matters from information supplied from so many parts.

I give the heads of these forms for reference.

**Form No. 23.** India.

*Number of mines at work, average number of persons employed, and weight of saleable Minerals wrought during the year 1894.*

| 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NUMBER OF PERSONS EMPLOYED AT EACH KIND OF MINE. | | | | | | | |
| | | | | | BELOW GROUND. | | | ABOVE GROUND. | | | | |
| Situation of Mine—State, Province, Division, or District. | Names or descriptions of minerals wrought. | Number of Mines at which each mineral was being worked during December. | State or condition of the minerals as named or described, whether dressed or undressed, etc. | Weight wrought of minerals as named or described. | Males. | Females. | Total below ground. | Males. | Females. | Total above ground. | Totals below and above ground. | REMARKS. |
| | | | | | | | | | | | | |

*Record of fatal and other serious accidents.*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date of accident. | Hour of day or night. | Hour of person's shift, or how long been at work. | Name of the Mine or Colliery. | Situation of Mine. | Description of Mine or name of mineral wrought. | Name of the Owner or Company. | Names and number of persons killed, and whether male or female. | Names and number of persons seriously injured; and whether male or female. | Reputed ages. | Occupations. | Cause of accident in terms of Form 25; and whether above or below ground. | Remarks on cause and nature of injury, and cause of death. |
| | | | | | | | | | | | | |

NOTE.—This is similar to the Accident report Form.

**Form No. 25.** India.

## *DEATHS caused by accidents at Mines in India.*

NOTE.—*Deaths* caused by injuries received within 1 year and 1 day from time of accident should be included.

| Name and situation of Mine.—State, Province, Division, or District, and minerals wrought there. | Year. | Falls in mines. | | | | In shafts. | | | | | | | | Miscellaneous below ground. | | | | | | | | On surface. | | | | | Gross Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Falls of roof, stone, or coal. | Falls of sides. | Falls of coal in working places. | Total falls. | Overwinding. | Ropes and chains breaking. | Whilst ascending or descending by machinery. | Falling into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in shafts. | Explosions of firedamp. | Suffocation by gases. | By explosives. | Irruptions of water, and falling into water. | On inclined and engine planes. | By trams or tubs. | By machinery. | By other causes. | Total Miscellaneous below-ground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | Total on surface. | |
| Remarks. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## *Number of persons* SERIOUSLY INJURED *by mining accidents.*

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remarks. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*Particulars of all Mines being worked in* _____.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of Mine: State, Province, Division, Sub-Division, District. | Nearest and most convenient Railway or other station. | Distance from Station. | Means available for getting to mine from Station. | Mineral wrought. | REMARKS. |
| | | | | | | | | |

## MINES IN INDIA.

### Numbers of Mines—

Summary of the foregoing statements.

The returns give the following numbers of Mines:—

*Coal Mines.*

| | | |
|---|---|---|
| In Bengal | 135 mines. | |
| „ Central Provinces | 5 „ | |
| „ Punjab | 9 „ | |
| „ Beluchistan | 14 „ | |
| „ Bombay Native States | 1 „ | |
| „ Hyderabad (Deccan) | 4 „ | These are all one mine or colliery. |
| „ Madras | 1 „ | |
| „ Assam | 4 „ | |
| „ Upper Burma | 1 „ | |
| TOTAL | 174 Coal mines. | |

The above figures are probably not quite correct if gauged strictly by the definition of mine already given for the purpose. For instance, I believe there is only one such coal mine in Hyderabad (Deccan), though it is in 4 principal Divisions.

It may be worth noting that the East Indian Railway Co.'s No. 2 "Jubilee" pit, Karhurbaree Colliery, Giridih, 650 feet deep, is probably the deepest *coal* pit in India at the present time. The Rowse's shaft of the Mysore Gold Mining Co., Kolar, is probably the deepest mine shaft in India being over 1,460 feet deep on an angle of 45°, or upwards of 1,000 feet of vertical depth.

*Salt Mines.*

| | |
|---|---|
| In Punjab | 2 mines. |
| „ Kashmir | 1 „ |
| TOTAL | 3 salt mines. |

*Mica Mines.*

| | |
|---|---|
| In Bengal | 56 mines. |
| „ Madras | 10 „ |
| TOTAL | 66 mica mines. |

The idea of Mine appears to have been in the opposite extreme in the case of Mica Mines, for the return of form 26 gave over 200 Mica Mines in Bengal with about as many separate names; but form 23 only gave 56 as shown above. And the above does not include the Mica Mine in Hyderabad (Deccan).

*Fireclay Mines.*

| | | |
|---|---|---|
| Bengal | 1 mine. | Returned as "clay." |
| Central Provinces | 1 „ | |
| TOTAL | 2 clay mines. | |

*Limestone Mines.*

| | |
|---|---|
| In Bombay British States | 24 mines. |
| „ „ Native „ | 11 „ |
| TOTAL | 35 limestone mines. |

*Stone Mines.*

| | | |
|---|---|---|
| In Bombay Native States | 46 mines. | Four are quarries. |
| TOTAL | 46 stone mines. | |

*Slate Mines.*

| | | |
|---|---|---|
| In Bengal | 2 mines. | |
| „ Bombay British States | 7 „ | returned as "pits." |
| TOTAL | 9 slate mines. | |

*Plumbago Mines.*

In Travancore . . . . . 1 plumbago mine.

*Manganese Mines.*

In Madras . . . . . 1 manganese mine.

*Gold Mines.*

| | |
|---|---|
| In Bengal | 1 mine. |
| „ Hyberabad (Deccan) | 4 mines. |
| „ Madras | 1 mine. |
| TOTAL | 6 gold mines. |

This does not include the 13 or thereabouts of gold mines in the Mysore State.

*Ruby Mines.*

In Upper Burma . . . . . 1 ruby mine.

*Sapphire Mines.*

In Upper Burma . . . . . 9 sapphire mines.

*Spinel Mines.*

In Upper Burma . . . . . 2 spinel mines.

*Soapstone Mines.*

In Madras . . . . . 1 soapstone mine.

*Fuller's Earth Mines.*

| | | |
|---|---|---|
| In Bombay British States | 8 mines. | |
| „ „ Native „ | 1 „ | A red earth called "Met." |
| TOTAL | 9 Fuller's Earth mines. | |

*Borax Mines.*

In Kashmir . . . . . 1 Borax mine.

There was also 1 mine returned for Kashmir, of which the mineral was described as "Pholi."

The sum of the foregoing mines, as given in the returns sent in, is —

| | |
|---|---|
| Coal Mines | 174 |
| Other „ | 193 |
| GRAND TOTAL | 367 mines. |

But this number does not include some mines in Native States.

There are 208 mica workings with separate names in Bengal, as shown on Form 26.

There are 17 substances returned as being mined in India.

The following statement gives the number of persons employed for each substance, distinguishing males and females, and those employed above and below ground.

## NUMBER OF PERSONS EMPLOYED.

| | Above ground. | | Below ground. | | Total above ground. | Total below ground. | Total above and below ground. |
|---|---|---|---|---|---|---|---|
| | Males. | Females. | Males. | Females. | | | |
| 1 Coal | 5,919 | 3,113 | 13,485 | 3,251 | 9,032 | 16,736 | 25,768 |
| | Returns of persons employed have not been received for *all* coal mines. | | | | | | |
| 2 Mica | 224 | 279 | 851 | 367 | 503 | 1,218 | 1,721 |
| 3 Gold | 512 | 489 | 447 | ... | 1,001 | 447 | 1,448 |
| | NOTE.—These do not include the Mysore Gold Mines. | | | | | | |
| 4 Salt | 60 | ... | 361 | 301 | 60 | 662 | 722 |
| 5 Slate | 150 | 115 | ... | ... | 265 | ... | 265 |
| 6 Lime stone | 21 | 3 | 37 | 6 | 24 | 43 | 67 |
| | Returns of persons employed have not been received for *all* these mines. | | | | | | |
| 7 Stone | 1,120 | 59 | 2,767 | 15 | 1,179 | 2,782 | 3,961 |
| 8 Fuller's Earth | ... | ... | 30 | ... | ... | 30 | 30 |
| 9 Red earth (also called "Met"). | ... | ... | 13 | ... | ... | 13 | 13 |
| 10 Clay | ... | ... | 10 | 6 | ... | 16 | 16 |
| 11 Manganese | The number of persons employed varies with the season from 600 to 1,100; one-half the total are females. | | | | | | (Average) 800 |
| 12 Soap stone | ... | ... | 40 | ... | ... | 40 | 40 |
| 13 Plumbago | 25 | 82 | 130 | ... | 107 | 130 | 237 |
| 14 Rubies, Sapphire, Spinels | 378 | ... | 146 | ... | 378 | 146 | 524 |
| 15 Borax | 39 | ... | ... | ... | 39 | ... | 39 |
| TOTAL | 8,448 | 4,140 | 18,317 | 3,946 | 12,588 | 22,263 | 34,851 |

## PERCENTAGES EMPLOYED AT MINES.

It will be noticed that the total number of persons returned as being employed both above and below ground is 34,851; and that of this total quantity 25,768 are employed at coal mines.

It may be useful to repeat a few of the figures in the following form:—

| | | | |
|---|---|---|---|
| Employed at coal mines. | 1. Total number of persons employed at coal mines . . 73·94 per cent. of the whole number employed. | 25,768 | or |
| | 2. Total number of persons employed at all mines other than coal mines . . . . . 26·06 per cent. of the whole number employed. | 9,083 | or |
| At all mines. | 3. Gross total employed above and below ground at all mines | 34,851 | |
| NOTE.—See exception below. | | | |
| At coal mines above ground. | 1. Total males employed above ground at coal mines, . 65·54 per cent. of the total number employed above ground at coal mines. | 5,919 | or |
| | 2. Total females employed above ground at coal mines . 34·46 per cent. of the total number employed above ground at coal mines. | 3,113 | or |
| | 3. Total number employed above ground at coal mines . | 9,032 | |
| At coal mines below ground. | 1. Total males employed below ground at coal mines, . 80·57 per cent. of the total number employed below ground at coal mines. | 13,485 | or |
| | 2. Total females employed below ground at coal mines . 19·43 per cent. of the total number employed below ground at coal mines. | 3,251 | or |
| | 3. Total number employed below ground at coal mines . | 16,736 | |
| At other mines above ground. | 1. Total males employed above ground at mines other than coal mines . . . . . 71·12 per cent. of the total number employed above ground at mines other than coal mines. | 2,529 | or |
| | 2. Total females employed above ground at mines other than coal mines . . . . . 28·88 per cent. of the total number employed above ground at mines other than coal mines. | 1,027 | or |
| | 3. Total number employed above ground at mines other than coal mines. . . . . | 3,556 | |
| At other mines below ground. | 1. Total males employed below ground at mines other than coal mines . . . . . 87·42 per cent. of the total number employed below ground at mines other than coal mines. | 4,832 | or |
| | 2. Total females employed below ground at mines other than coal mines . . . . . 12·58 per cent. of the total number employed below ground at mines other than coal mines. | 695 | or |
| | 3. Total number employed below ground at mines other than coal mines. | 5,527 | |

| | | | |
|---|---|---|---|
| At all mines above ground. | 1. Total males employed above ground at all mines . . 67·12 per cent. of the total number employed above ground at all mines. | 8,448 | or |
| | 2. Total females employed above ground at all mines . 32·88 per cent. of the total number employed above ground at all mines. | 4,140 | or |
| NOTE—See exception below. | 3. Total number employed above ground at all mines. | 12,588 | |

| | | | |
|---|---|---|---|
| At all mines below ground. | 1. Total males employed below ground at all mines . 82·27 per cent. of the total number employed below ground at all mines. | 18,317 | or |
| | 2. Total females employed below ground at all mines . 17·73 per cent. of the total number employed below ground at all mines. | 3,946 | or |
| | 3. Total number employed below ground at all mines . | 22,263 | |
| | 4. Total females employed both above and below ground at all mines . . . . . 23·20 per cent. of all the persons employed at all mines. | 8,086 | or |

| | | |
|---|---|---|
| At all mines above and below ground. | 1. Total number of persons employed at all mines, excepting the Mysore mines. | 34,851 |
| | 2. Total number of persons employed above ground at the Kolar gold mines. | 5,267 |
| | 3. Total number of persons employed below ground at the Kolar gold mines. | 7,006 |
| | 4. Total number of persons employed above ground at other Mysore gold mines. | 144 |
| | 5. Total number of persons employed below ground at other Mysore gold mines. | 118 |
| | 6. Total number of persons employed at all mines, including Mysore mines. | 47,386 |

NOTE 1.—Females are not allowed below ground at the Mysore gold mines.
NOTE 2.—The numbers for the Mysore mines were not included in the Returns.

## Summary of weights of minerals wrought.

The following is a short summary of the quantities of the various substances mined :—

| | | |
|---|---|---|
| 1. Coal (dressed) . . . . . | 743,305 | tons. |
| „ (undressed) . . . . . | 1,405,688 | „ |
| „ (dressed and undressed) . . | 410,974 | „ |
| A gross total of . | 2,559,967 | tons of coal wrought. |
| 2. Mica (dressed) . . . . . | 71 | tons. |
| „ (undressed) . . . . . | 373 | „ |
| A gross total of . | 444 | tons of mica wrought. |

| | | |
|---|---|---|
| 3. Salt (undressed) . . . . | 90,031 | tons of salt wrought. |
| 4. Slate (undressed) . . . . | 5,174 | tons. |
| „ (dressed and undressed) . . | 500 | „ |
| A gross total of . | 5,674 | tons of slate wrought. |
| 5. Limestone (soft) . . . . | 530 | tons. |
| „ (common) . . . | 1,675 | „ |
| „ . . . . . | 2,190 | „ |
| A gross total of . | 4,395 | tons of limestone wrought. |
| 6. Stone . . . . . | 558 | tons. |
| „ (hard) . . . . | 2,120 | „ |
| „ (soft) . . . . | 1,125 | „ |
| „ (common) . . . . | 3,016 | „ |
| „ (not good) . . . . | 20 | „ |
| A gross total of . | 6,839 | tons of stone wrought. |

I understand that this quantity is exclusive of the large quantities of kankar got from shallow quarries for the purpose of mending roads.

| | | |
|---|---|---|
| 7. Fuller's earth (pure) . . . | 134 | tons. |
| 8. Red earth (called "Met") . . | 14 | tons, undressed. |
| 9. Manganese (dressed) . . . | 11,000 | tons. |
| 10. Soap stone (dressed) . . . | 53½ | tons. |
| 11. Plumbago (undressed) . . . | 1,597½ | tons. |
| 12. Rubies, Sapphires, Spinels } dressed to a marketable condition. | 38,667 | carats. |
| 13. Borax . . . . . | 73½ | tons. |
| 14. Gold :— | | |

## Output of gold.

Bengal.—1,000 tons of quartz yielded 99 oz. 4 dwts. of gold.

Madras.—This gold mine, which is apparently the Mysore Reefs mine of Kolar, is credited with an outturn of 324 oz. 3 dwts. of gold.

The Mysore Gold Mines.—The outturn of gold from all these mines, for the year 1894, is stated to be worth £844,000, and to have yielded a revenue to the Mysore Government of ₹7,33,000.

I have not full particulars for the year 1894-95, but the following particulars for the two previous years will show the extent and importance of the gold mining in Mysore :—

*Kolar Gold Mines, Mysore State.*

| Name of Company. | 1892-93 (1st July to 30th June). | | | 1893-94 (1st July to 30th June). | | |
|---|---|---|---|---|---|---|
| | Weight of bar gold produced. | Equivalent in standard gold. | Certified value in £. | Weight of bar gold produced. | Equivalent in standard gold. | Certified value in £. |
| | oz. | oz. | £ | oz. | oz. | £ |
| Mysore Gold Mining Company . | 71,537 | 71,154 | 277,128 | 54,183 | 54,239 | 210,961 |
| Oorgaum ditto . . | 65,956 | 63,238 | 246,635 | 76,026 | 73,106 | 284,082 |
| Nundydroog ditto . . | 29,354 | 28,202 | 110,003 | 25,593 | 24,395 | 95,003 |
| Balaghat ditto . . | 8,472 | 8,434 | 32,875 | 5,792 | 5,680 | 22,104 |
| Champion Reef ditto . . | 20,596 | 19,989 | 77,926 | 37,966 | 37,041 | 144,584 |
| Indian Consolidated ditto . . | 102 | 100 | 390 | ... | ... | ... |
| Mysore West ditto . . | ... | ... | ... | 65 | 65 | 239 |
| Mysore Wynaad ditto . . | ... | ... | ... | 65 | 65 | 239 |
| | 196,017 | 191,117 | 744,957 | 199,690 | 194,591 | 757,212 |

*Government Revenue from Mysore Gold Mines.*

| | 1892-93. | 1893-94. | Difference. |
|---|---|---|---|
| Gold Mining— | ₹ | ₹ | ₹ |
| (*a*) Five per cent. Royalty . . | 4,95,351 | 7,22,129 | +2,26,778 |
| (*b*) Prospecting License fees, Premia on new leases granted, etc. | 508 | 3,500 | +2,992 |
| TOTAL GOLD MINING . | 4,95,859 | 7,25,629 | +2,29,770 |

## Statistics relating to Indian coal.

### 14.—INDIAN COAL.

I much regret that I have not been able to get all the particulars I was wishful to give in this place. I should like to have had full statistics for 1894, so as to have taken that year as a sort of base line of Indian mining with which the future prosperity of mining could be compared. For this purpose I will give a few extracts from the "Review of Mineral Production in India for 1893."

"Year after year the production of coal has made steady progress. The internal demand has vastly increased owing to the extension of mill-industries, the opening of new railways, and the consumption by Ocean steamers, which formerly used foreign coal. Not only has the increased internal demand been met entirely by greater home-production, but, as the following table would seem to show, Indian coal has to some extent superseded the use, and thus reduced the import, of the foreign article :—

*Imports of coal, coke, and patent fuel from Foreign Countries.*

| YEAR. | Bengal. | Bombay. | Sind. | Madras. | Burma. | TOTAL. | | Total including Government Stores. | |
|---|---|---|---|---|---|---|---|---|---|
| | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | ₹ | Tons. | ₹ |
| 1888-89 . . . | 19,376 | 642,762 | 46,596 | 46,866 | 77,878 | 833,478 | 1,90,72,128 | 877,843 | 2,00,95,105 |
| 1889-90 . . | 23,170 | 435,755 | 32,279 | 62,666 | 47,800 | 601,670 | 1,30,85,897 | 656,867 | 1,42,92,390 |
| 1890-91 . . . | 10,047 | 632,926 | 54,274 | 50,818 | 36,599 | 784,664 | 1,54,34,420 | 817,004 | 1,60,58,153 |
| 1891-92 . . . | 22,812 | 566,231 | 54,799 | 45,094 | 48,088 | 736,971 | 1,25,04,927 | 773,624 | 1,30,85,912 |
| 1892-93 . . . | 12,831 | 504,083 | 37,077 | 66,380 | 27,814 | 648,185 | 1,14,14,503 | 703,341 | 1,25,19,578 |

"The statement that the imports have not continued to expand with the increasing demand, may be shown by the following imports during the ten years previous to 1888-89, *viz.*—

| YEARS. | 1878-79. | 1879-80. | 1880-81. | 1881-82. | 1882-83. | 1883-84. | 1884-85. | 1885-86. | 1886-87. | 1887-88. |
|---|---|---|---|---|---|---|---|---|---|---|
| Imports . . . . | 475,960 | 590,923 | 683,768 | 637,124 | 638,824 | 708,358 | 741,129 | 790,930 | 765,668 | 848,878 |

The recent miners' strike in England gave, it is believed, a great impetus to the export of Bengal coal to the other seaboard provinces of India where English coal was formerly used, so that next year's returns of output (return for 1894) may very likely manifest a still greater expansion. Madras and Burma, for example, have come to be important markets for Bengal coal.

The following table will show how the trade has increased within the last five years:—

*Export of Bengal coal by sea to other Provinces.*

| Year. | To Bombay. | | To Madras. | | To Burma. | | Total. | |
|---|---|---|---|---|---|---|---|---|
| | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ |
| 1888-89. . . . . | 13,436 | 1,31,262 | 2,270 | 31,762 | 23,814 | 2,43,582 | 39,520 | 4,06,606 |
| 1889-90. . . . . | 2,008 | 19,081 | 2,768 | 24,991 | 47,687 | 5,15,185 | 52,463 | 5,59,257 |
| 1890-91. . . . . | 4,000 | 47,000 | 29,763 | 2,98,901 | 69,908 | 6,51,073 | 103,671 | 9,96,974 |
| 1891-92. . . . . | *Nil.* | *Nil.* | 52,270 | 5,92,580 | 70,145 | 7,06,157 | 122,415 | 12,98,737 |
| 1892-93. . . . . | 45,595 | 4,54,259 | 60,570 | 7,18,093 | 88,611 | 9,03,019 | 194,776 | 20,75,371 |

Besides the inter-provincial trade shown in the above table, there is a fluctuating export trade in Indian coal with foreign countries of a not very important character at present, but which is capable of considerable expansion. Of the foreign countries, Ceylon affords a steady market for the Bengal coal. Japan has begun to test with England for Asiatic markets, and India also seems likely to make a strenuous effort in that direction. It is thus probable that the miners' strike may have done irreparable injury to the English Asiatic markets. The following table shows the export of Bengal coal to foreign markets.

*Table showing the export of Bengal coal to Foreign Countries: exclusive of coke and patent fuel.*

| Year. | To Ceylon. | | To China. | | To Straits Settlements. | | To Java. | | To Mauritius and the West Indies. | | To Arabia and Africa. | | To other countries. | | Total. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ | Tons. | ₹ |
| 1888-89 . . | 6,993 | 65,994 | 1,450 | 13,156 | 7,197 | 67,970 | *Nil.* | *Nil.* | *Nil.* | *Nil.* | *Nil.* | *Nil.* | 4 | 123 | 15,644 | 1,47,243 |
| 1889-90 . . | 18,620 | 1,86,440 | 770 | 7,052 | 13,883 | 1,33,330 | 4,165 | 39,550 | 800 | 8,000 | 1,610 | 14,490 | 113 | 1,075 | 39,962 | 3,88,937 |
| 1890-91 . . | 15,157 | 1,50,947 | *Nil.* | *Nil.* | 5,869 | 59,667 | 4,000 | 40,000 | 575 | 5,712 | *Nil.* | *Nil.* | 702 | 7,044 | 26,303 | 2,63,372 |
| 1891-92 . . | 1,000 | 10,000 | *Nil.* | *Nil.* | 2,100 | 21,000 | *Nil.* | *Nil.* | *Nil.* | *Nil.* | 250 | 2,250 | 1,014 | 10,336 | 4,364 | 43,586 |
| 1892-93 . . | 13,379 | 1,36,230 | *Nil* | *Nil.* | 3 | 150 | *Nil.* | *Nil.* | 1,518 | 12,358 | *Nil.* | *Nil.* | 720 | 7,050 | 15,620 | 1,55,788 |

## Increase of production.

To meet the increased demands the production of Indian coal has more than doubled. Ten years ago the total output from all the mines in India was a little over a million tons, but in 1893 it was more than 2½ million tons." The returns I have received show that the output of coal in India for 1894 was more than 2,559,967 tons. This is an increase, and fulfils the expectation referred to above.

In 1878, there were only 46 collieries in all India, of which 44 were in Bengal and 2 in the Central Provinces. In that year the total output was a little over one million tons, of which Bengal raised 956,000 tons.

In 1890, there were 82 collieries in all India, of which 73 were in Bengal, 1 in Punjab, 2 in the Central Provinces, 3 in Assam, 1 in Central India, 1 in Hyderabad (Deccan), and 1 in Beluchistan. The output of that year was more than 2 million tons, to which Bengal contributed 1,626,000 tons. Mines have also lately been opened in Burma; in 1893 the output from these came to 9,938 tons.

In December 1894, there appear to have been 174 coal mines at work in all India, or more than double the number there was in the

year 1890, and of this number 135 were in Bengal. Of the total output of coal for 1894, namely, 2,559,967 tons, the return for Bengal gives 1,770,888 tons or an increase for Bengal of 144,888 tons over the output of 1890.

## The demand has increased.

Another vital point is, that the greatly increased production has not lowered the prices, nor flooded the market with coal; on the other hand, I believe that in 1894, and the beginning of 1895, the ruling prices for coal of fair quality were good, as compared with working costs they might, I think, be described as high; and even poor coals could be sold at a fair price. I believe the output was barely equal to the demand.

Coal and coke appears to be displacing timber for private and public cooking purposes in various parts of India. I am told that there is a fair demand and a steadily increasing market for crude coke, and that its use for the cooking and other fires in the up-country bazars is becoming extensive. I am also told that it is not unusual to work out coal at an all round cost of not more than ₹1-8 a ton; that good coal has sold at the pit as high as ₹5-4 to ₹5-8 a ton; and that a profit of ₹2 a ton was not thought to be excessive.

## Prices.

This shows really good and all round rapid progress, and prompts the expression of an earnest hope that it will long continue on such a firm and solid basis as to be lasting. One of the natural consequences of the progress and good times in the coal trade is that there are quite a number of very small mines, and owners with very small capital who hurried into the trade in a way that they could only do when the trade is very flourishing. In fact, many appear to have become mine owners without any capital, and without any mining experience, and help to make a Mines Regulation Act a necessity to show them the way about in mining for the protection of themselves, their workmen, and the public, for some might not inaptly be described as danger makers. The asking and giving of large sums for "Salaamat" is another result of the flourishing trade; as is also high royalties, or what would have been considered high only a short time ago, and such as will be felt to be high if the trade should unfortunately go down. The system of subletting may also be brought under the effects of the crush to become mine owners. Babu A secures some coal on lease at a royalty of 7 annas a ton, he prefers to take life easily rather than have the trouble and responsibility of working a mine for which he has neither inclination, intention, experience, nor capital. He promptly finds a customer willing to take a lease of the coal from him and to begin working it at a royalty of 11 annas up to 14 annas a ton. Babu A then manages to smoke his hookah, eat his pán, superintend the cultivation of a small plot of land, draw 4 to 7 annas royalty over the amount he has to pay, and to live in a very comfortable sort of way. If the conditions of the working of the mine are not very favourable, the sub-lessee spends a good deal of time regularly on thinking out how he can make the mine pay, his idea being that the profits must not be less than 1 rupee for each ton of coal raised, and everything else is made of secondary importance to that rupee a ton profit. Another sign of the times is that the large mine owners are unable to raise

as much coal from their mines as they can sell. The small mine owner saves himself some trouble, and suffers a little in his selling prices by selling all the coal he can raise to a larger mine owner with a Calcutta agent. Several of the largest European mines have been adding to their own output by buying up all the coal raised at some of the small native mines, the demand of their customers being greater than their own supply.

## Comparison of output of coal since 1880.

The followimg statement, and some other information, is taken from the "Administration Report on the Railways in India for 1894-95."

*Quantity, in tons, of coal produced in India during the last fifteen years.*

| Years. | Provinces. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bengal. | Punjab. | Central Provinces. | Assam. | Central India. | Nizam's Territory. | Madras. | Beluchistan. | Burma. | Total. |
| | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. |
| 1880 | 988,565 | ... | 31,228 | ... | ... | ... | ... | ... | ... | 1,019,793 |
| 1881 | 930,203 | ... | 67,527 | ... | ... | ... | ... | ... | ... | 997,730 |
| 1882 | 1,038,872 | ... | 91,370 | ... | ... | ... | ... | ... | ... | 1,130,242 |
| 1883 | 1,200,957 | ... | 115,019 | ... | ... | ... | ... | ... | ... | 1,315,976 |
| 1884 | 1,257,392 | ... | 121,833 | 16,493 | 2,100 | ... | ... | ... | ... | 1,397,818 |
| 1885 | 1,123,700 | ... | 119,116 | 43,707 | 7,698 | ... | ... | ... | ... | 1,294,221 |
| 1886 | 1,186,802 | ... | 117,287 | 70,859 | 13,539 | ... | ... | ... | ... | 1,388,487 |
| 1887 | 1,319,090 | 7,523 | 128,981 | 89,302 | 15,497 | 3,259 | ... | 411 | ... | 1,564,063 |
| 1888 | 1,380,594 | 11,249 | 157,768 | 101,528 | 41,580 | 13,382 | ... | 2,802 | ... | 1,708,903 |
| 1889 | 1,541,356 | 22,835 | 144,465 | 116,676 | 52,956 | 59,646 | ... | 8,238 | ... | 1,946,172 |
| 1890 | 1,626,245 | 40,677 | 137,022 | 145,708 | 77,842 | 125,486 | ... | 15,541 | ... | 2,168,521 |
| 1891 | 1,747,122 | 60,714 | 141,736 | 154,208 | 69,741 | 144,668 | 20 | 10,368 | ... | 2,328,577 |
| 1892 | 1,920,050 | 66,352 | 132,005 | 164,050 | 88,623 | 149,601 | 61 | 13,284 | 3,670 | 2,537,696 |
| 1893 | 1,870,720 | 77,294 | 135,118 | 164,420 | 94,348 | 157,421 | 502 | 20,094 | 9,938 | 2,529,855 |
| 1894 | 1,989,373 | 66,467 | 140,495 | 169,448 | 132,837 | 240,525 | 1,337 | 21,498 | 12,111 | 2,774,091 |
| The following are the figures sent in the Returns to my office.—J. G. | | | | | | | | | | |
| 1894 | 1,770,888 | 66,467 | 273,331 | 170,298 | Included with Central Provinces. | 240,525 | 1,337 | 24,753 | 12,368 | 2,559,967 |
| | | | | | | | | | | 214,124 difference |

Page 296 of the appendix gives an additional 724,210 tons of coal.—J. G.

## USE AND QUALITIES OF COALS.

The following particulars of the total quantity of fuel consumed on the standard and metre gauge railways during 1893 and 1894 will show to what extent the coal is used on railways, and the amount of English coal imported for that purpose :—

| Years. | Coal. | | | Coke. | Patent fuel. | Wood. |
|---|---|---|---|---|---|---|
| | English. | Indian. | Total. | | | |
| | Tons. | Tons. | Tons. | Tons. | Tons | Tons. |
| 1893 . . . . | 178,656 | 919,943 | 1,098,599 | 4,957 | 6,135 | 358,756 |
| 1894 . . . . | 127,520 | 1,059,158 | 1,186,678 | 3,590 | 2,694 | 339,657 |

The total consumption of coal during 1894 was 8·02 per cent. greater than in 1893. The quantity of English coal used was 28·62 per cent. less, and that of Indian coal 15·13 per cent. more.

### Qualities of fuel.

*Qualities of coals and other fuel.*

Taking 1 ton of Giridih (Kurhurbaree) best steam coal as the standard, the fuels are compared as follows :—

| Description. | Equivalents. Co-efficients. |
|---|---|
| 1. Giridih (Kurhurbaree) best steam coal (the standard) | 1·00, 1·00. |
| 2. Kurhurbaree (East Indian Railway) selected large coal . . . . . | 0·90, 1·11. |
| 3. Welsh best steam coal . . . . . | 0·80, 1·25. |
| 4. Patent fuel . . . . . | 0·70, 1·43. |
| 5. Singareni coal . . . . . | 1·05, 0·95. |
| 6. Bengal or Barakar steam coal . . . . | 1·10, 0·90. |
| 7. Umaria coal . . . . . | 1·25, 0·80. |
| 8. Mohpani coal . . . . . | 1·50, 0·66. |
| 9. Warora coal . . . . . | 1·80, 0·56. |
| 10. Wood fuel . . . . . | 2·50, 0·40. |

The " Equivalent " numbers may be taken as the relative quantities of the fuels required to give a power value equal to the standard; and the " Co-efficients " show at once the relative power values.

" These factors have been arrived at from a careful examination and comparison of the results of trials carried out within recent years on several railways, and are believed to represent the relative values of the different fuels as near as possible. As the figures are only approximate, however, it is not intended that they should be used where more reliable results have been obtained by actual experiment.

*Comparisons of the qualities of Indian and other coals and fuels.*

The equivalents used during the second-half of the year 1894-95 are given by the following equivalents of 1 ton of Giridih (Kurhurbaree) best steam coal in terms of other descriptions of fuel as used by some of the principal railways.

*The standard.*—Giridih (Kurhurbaree) best steam coal=1.

Then, the *number of tons* required of other fuels to give the equivalent of the standard 1 ton is as follows:—

| | *Equivalent numbers in tons.* |
|---|---|
| 1. Kurhurbaree best steam coal . | 1. |
| 2. English coal . . . | 0·72, 0·80, 0·82, 0·83, 0·90. |
| 3. Patent fuel, English . . | 0·68, 0·72, 0·73, 0·80. |
| 4. „ „ Khost and Dandot | 1·16. |
| 5. Sanctoria . . . | 1·00, 1·08, 1·11. |

| | | |
|---|---|---|
| 6. | Bhadrachelam . . . | 1·00, 1·11, 1·42, 2·00. |
| 7. | Barakar . . . . | 0·88, 1·00, 1·11, 1·13, 1·14, 1·42. |
| 8. | Gourandih . . . . | 1·00, 1·11, 1·13, 1·42. |
| 9. | Sodepore . . . . | 0·97, 1·00, 1·11, 1·42. |
| 10. | Laikdee . . . . | 1·00, 1·03, 1·11, 1·42. |
| 11. | Shibpore . . . . | 1·00, 1·11, 1·42. |
| 12. | Sitarampore . . . | 1·00, 1·11, 1·13, 1·14, 1·42. |
| 13. | Giridih . . . . | 1·00, 1·11, 1·42. |
| 14. | Katras, Jherriah . . | 1·00, 1·11, 1·19, 1·20, 1·42. |
| 15. | Borrea . . . . | 1·00, 1·01, 1·11, 1·15, 1·29, 1·42. |
| 16. | Dhadka . . . . | 1·00, 1·11, 1·13, 1·16, 1·42. |
| 17. | Desherghar . . . | 0·86, 1·00, 1·11, 1·42. |
| 18. | Singareni, screened . . | 1·02, 1·05, 1·09. |
| 19. | „ unscreened . . | 1·20, 1·25, 1·49. |
| 20. | Umaria . . . . | 1·25, 1·29. |
| 21. | Mohpani . . . . | 1·51. |
| 22. | Warora . . . . | 1·78. |
| 23. | Dandot . . . . | 1·42. |
| 24. | Khost . . . . | 1·16. |
| 25. | Assam coal . . . | 0·94. |
| 26. | Burma (Thingadaw) coal . | 2·56. |
| 27. | Japanese coal . . . | 1·25. |
| 28. | Wood . . . . | 2·00, 2·40, 2·50, 2·60, 2·82, 2·86, 3·00. |

## COST OF FUEL, 1894.

### Prices paid for fuel.

The average cost per ton of fuel used on the various railways varied greatly, in fact it was from ₹1·91 per ton for Bengal coal to the East Indian Railway, to ₹23·60 per ton for Bengal coal to the Jodhpore Section of the Rohilkund and Kumaon Railway. The average of the average costs for fuel used on 22 railways was ₹10·34 per ton.

A few further particulars of prices of coal will be useful for reference. The East Indian Railway (standard gauge) only used the coal from its own collieries at Kurhurbaree and Serampore, Giridih; with the exception of a trial quantity of 564 tons of Umaria coal which was used on the Jubbulpore line for experimental purposes. The issue price of the coal from January to September 1894 was ₹1-14-0 per ton, and from October to December ₹2-10-0 per ton.

Prices paid by other various railway companies were:—

| | ₹ | a. | p. | |
|---|---|---|---|---|
| 1. For Barakar coal delivered into wagons at Barakar . . . . . | 3 | 2 | 0 | per ton. |
| 2 For Gourandih coal delivered into wagons at Gourandih colliery . . . . . | 2 | 8 | 0 | „ |
| 3. For Gourandih coal delivered into wagons at Sitarampur . . . . . | 2 | 4 | 0 | „ |
| 4. For Assam coal delivered at Sara and Jatrapur | 11 | 0 | 0 | „ |
| 5. For Kurhurbaree coal delivered into wagons at Giridih . . . . . | 3 | 4 | 0 | „ |
| 6. For Kurhurbaree coal delivered into wagons at Giridih . . . . . | 3 | 0 | 0 | „ |
| From January to March, and from April to December . . . . . | 3 | 2 | 0 | „ |
| 7. For Borrea coal delivered into wagons at Sitarampur, Borea siding . . . . | 3 | 8 | 0 | „ |
| 8. For Borea coal delivered into wagons at Umaria pit head . . . . . | 4 | 3 | 0 | „ |

| | R | a. | p. | |
|---|---|---|---|---|
| 9. For Umaria coal delivered into wagons at Umaria, January to April R4-3-0 per ton, May to December . . . . . | 4 | 0 | 0 | per ton. |
| 10. For Madancotta coal delivered into wagons at Madhupur R2-12-0 and . . . . . | 3 | 0 | 0 | „ |
| 11. For Rubble coal delivered into wagons at Giridih . . . . . | 2 | 12 | 0 | „ |
| 12. For Dandot coal supplied from Khewra and Bhaganwalla collieries and delivered into wagons at Kalapani and Haranpur Stations . | 9 | 0 | 0 | „ |
| 13. For Khost coal supplied from the Khost and Sharigh mines and delivered into wagons at Khost and Sharigh stations . . . . | 16 | 0 | 0 | „ |
| 14. For Patent fuel, made out of Khost dust coal, delivered into wagons at Quetta . . . | 27 | 0 | 0 | „ |
| 15. For English coal delivered into wagons at Kurrachee, average rate, including exchange . | 20 | 1 | 3 | „ |
| 16. For Welsh coal delivered at Bombay (but purchased from Messrs. Ritchie Stewart & Co. at Bombay in 1890) . . . . . | 28 | 0 | 0 | „ |
| 17. For Bengal steam coal delivered into wagons at Sanctoria . . . . . | 2 | 10 | 0 | „ |
| 18. For English coal delivered into boats, Bombay, R17-8-0 per ton to . . . . . | 18 | 0 | 0 | „ |
| 19. For Japanese coal delivered into boats, Bombay | 12 | 0 | 0 | „ |
| 20. For Bengal sea-borne coal delivered into boats, Bombay, R12-8-0 per ton to . . . | 13 | 8 | 0 | „ |
| 21. For Patent fuel delivered into boats, Bombay, R17-0-0 per ton to . . . . . | 17 | 8 | 0 | „ |
| 22. For Singareni coal (screened) delivered into wagons at Yellandu . . . . . | 6 | 0 | 0 | „ |
| 23. For Singareni coal (unscreened) delivered into wagons at Yellandu . . . . . | 4 | 8 | 0 | „ |
| 24. For Nerbudda coal delivered into wagons at Mohpani . . . . . | 6 | 0 | 0 | „ |
| 25. For Warora coal delivered into wagons at pit's mouth . . . . . | 4 | 8 | 0 | „ |
| 26. For Sanctoria coal delivered into wagons at pit's mouth . . . . . | 3 | 0 | 0 | „ |
| 27. Umaria (large) coal delivered into wagons at Umaria . . . . . | 4 | 3 | 0 | „ |
| 28 For Umaria (washed nuts) coal delivered into wagons at Umaria R2-2-0 per ton to . . | 2 | 4 | 0 | „ |

The following are comparative prices paid by another railway :—

| | | | | |
|---|---|---|---|---|
| 29. For Singareni coal delivered at Rayapuram and at Raichur from R13-12-0 to . . . | 15 | 0 | 0 | „ |
| 30. For Barakar coal delivered at Rayapuram . | 14 | 14 | 0 | „ |
| 31. For Kurhurbaree coal delivered at Rayapuram and at Raichúr . . . . . | 13 | 14 | 0 | „ |
| 32. For Patent fuel delivered at Ráyapuram . | 24 | 0 | 3 | „ |

The Nizam's Guaranteed State Railway paid :—

| | | | | |
|---|---|---|---|---|
| 33. For Singareni coal an average of R4-9-7 per ton. Freight of coal on the Nizam's Guaranteed State Railway from the Singareni colliery, Yellandu to Bezwada . . . | 3 | 0 | 0 | „ |
| 34. Price of Scotch coal delivered at Cocanada (including exchange) . . . . | 23 | 0 | 0 | „ |

| | R | a. | p. | |
|---|---|---|---|---|
| 35. Price of Sitarampur coal delivered at Cocanada (including exchange) . . . . . | 14 | 0 | 0 | per ton. |
| 36. Price of Bengal coal delivered into wagons at Giridih . . . . . | 3 | 11 | 10 | „ |
| 37. Price of Australian coal delivered at Sabarmati . . . . . | 20 | 15 | 0 | „ |
| 38. Price of English coal delivered at Sabarmati (including exchange) . . . . . | 24 | 0 | 0 | „ |
| 39. Price of Borrea coal from Sitarampur delivered at the port of Negapatam R14-4-0 to . . | 16 | 10 | 0 | „ |
| 40. Price of Desherghar coal delivered at the port of Negapatam . . . . . | 15 | 5 | 0 | „ |
| 41. Price of Laikdee coal delivered at the port of Negapatam . . . . . | 15 | 7 | 0 | „ |

## Use of mixed round coal and small.

The following statement may be earnestly commended for the beneficial consideration of mine owners and coal users:

"Southern Mahratta Railway.—Experiments were made on the Bijapur branch with a view to the use of unscreened Singareni coal instead of the screened steam coal usually supplied by the Hyderabad-Deccan Company; the results were so satisfactory that a six months' trial on the same section of the line under ordinary working conditions was arranged for; and this also proving successful, the use of unscreened coal was extended to all coal burning sections of the Southern Mahratta Railway in the second half of 1894." I can confidently recommend an extension of the use of unscreened coal, when ordinary care is taken to keep the coal in as good condition as possible and reasonably free from dirt. The coal from many Indian mines is peculiarly fitted for burning just in the state that it comes out of the pit; the sandstone roof and floor and freedom in other ways from shale making it easily possible to send the coal out of the mine clean and in good condition. There is much more in this matter than may at first sight appear, and in some cases there is more money to be saved by it than the difference of selling prices:—1, the seller will get a greater return on his coal; 2, the coal user will get all the coal and power he requires at less cost; 3, there will be a less number of underground fires, burning slack heaps on the surface; greater safety, and less cost in dealing with things arising from accumulations of valuable fuel that appears to be thought to have little economic value. Underground fires are a menace to mining, and a danger to all; and I shall look upon the extended use of unscreened coal, and of coke made from slack with pleasure as playing no small part in the hoped for ultimate extinction of underground fires.

## 15—UNDERGROUND AND OTHER FIRES.

### Underground fires.

Amongst the fires that have come under my notice may be mentioned the following:—

1. There has been coal on fire below ground, and sealed off, for

many years at the East Indian Railway Company's colliery at Giridih; and it has been the cause of at least one fatal accident.

2. The coal at very inconvenient parts of the Government of India Warora colliery has been on fire for some time, and has caused several deaths.

3. Parts of the workings of the Nerbudda Coal and Iron Company's Mohpani mine have been on fire for many years, and sometimes burns up through to the surface. These fires are so well established as to give names to the different sections of the mine, as O. F. W. (old fire workings).

4. A large slack heap on the surface at the Singareni colliery has been on fire for some years, and has caused two deaths.

5. In addition to other underground fires there are several parts of the mining districts where considerable areas of coal had taken fire while a part was being worked, and ultimately abandoned to burn itself out.

6. One of the mines in the Beluchistan coal field was found to be on fire in March last " and in spite of all openings having been blocked the fire has not yet been put out."

It appears that many of the Indian coals are liable to take fire spontaneously. Underground fires are often very difficult to extinguish, and they are a great source of danger, expense, and hinderance, and every means should be taken to avoid them. It is a matter of much more than individual interest; several mines in Bengal are often worked so near together, and even are connected by underground passages, that a fire in one mine may be very dangerous to other mines and workmen as well as to that where it first begins to burn. This gives one more of the very many reasons for Inspection and Mines Regulation being necessary. When a mine is being opened or begun, or a system of working is being decided on, the possibility and the probability of the mine taking fire should be well thought out and every arrangement made to reduce the probability to a minimum. Every precaution should also be taken to avoid fires arising from torch and other open lights, underground furnaces, etc. The question of the construction of underground furnaces in a way that will be the least likely for the coal and strata being set on fire will have to be seriously dealt with : and workmen and women should be strictly forbidden and prevented from making fires underground on heaps of small coal and other such places, as I have seen in Indian mines ; nothing of the kind should be allowed at all. It will prevent danger, and be of benefit in many ways to always remember and always act on the principle of the motto that—

" Prevention is better than cure."

1. *Rokháwat bhetarhi bansabat álá ke.*

1. روکاوٹ بہتر ھی بنسبت علاج کے *

2. रोकावट बेहतर है बनिसबत उपाय के।

3. সাবধানের বিনাশ নাই।

This is fully true of most mining matters, and it applies to some very forcibly indeed, but it probably applies to underground fires with greater force than to anything else, they may so quickly become almost insuperably difficult to deal with, and dangerous in propor-

tion. Another matter in this connection that I cannot lay too much stress on is, that something should always be kept in readiness by which a fire could be dealt with promptly. The very least preparation for such a contingency should be that the Manager has carefully thought out for all parts of his mine what course of action will be best to adopt in the case of any part being found on fire. Every Manager of every mine should carefully do this, and post himself up with the best and most adaptable practices. Promptness of action may mean saving the mine, and the saving of life; loss of time may cause the loss of everything.

## PRECAUTIONS.

### Paraffin Lamps.

Acquaintance with return airways:—

I think it is desirable that serious attention should be called to the risks attending the use of kerosine oil, large open lamps; and the indiscriminate kindling of fires below ground; and that they should be disallowed where they are not absolutely necessary, and should never be used without sufficient precautions being taken.

I also wish to impress mine officials with the desirability of all persons employed below ground being acquainted with the way of exit from their working places by the "return airways," or by at least two ways altogether; because circumstances may arise, as for instance, in case of a large fire at any part of the intake air passage into and through the mine, when it would become dangerous or impossible to leave by the ordinary or the intake air courses. Very disastrous accidents have happened during the last few years in the United Kingdom, from fires that had very ordinary and small beginnings, but filled the intakes and workings with smoke and smothered numbers of men who did not know any other but the ordinary way out.

## 16.—FEMALES AND YOUNG CHILDREN.

### Employment of females and young children:—

There is very little that is new to record with reference to the employment of females and young children below ground.

### The Kolar and other Mysore gold mines:—

There were no females employed below ground.

There were only about four boys under 18 years of age employed below ground.

The youngest ages at which boys and girls were employed above ground were six or seven years of age, twenty-four of 8 years, and a few of 10 to 12 years of age. The great majority were over 12 years of age.

### The Warora mine:—

There were no females employed below ground.

The youngest boy employed below ground was 12 years of age.

The youngest boys and girls employed above ground were 10 years of age, but there were only a few so young.

The Mohpani mine:—

There were a few boys and girls employed above ground and below ground as young as 10 years of age, but I believe none younger.

The Umaria mine:—

There were a few boys and girls employed below ground as young as 12 years of age, but apparently none younger. On the surface, the youngest boys appeared to be 14 years of age, and the girls 13 years of age.

The Singareni mine:—

There were two boys as young as 9 years of age, and two girls as young as 11 years employed below ground.

And there were six boys from 8 to 10 years of age, and two girls of 10 years employed above ground.

The following form gives a few further particulars for the Umaria, Mohpani, and Singareni mines.

FORM 28.

*Employment of Young children and females in mines; etc.*

| Question. | Answer. |
|---|---|
| 1. Would the mining people like their children educated so far as to be able to read and write? | 1. *Umaria.*—There is not much desire for education, except among the more respectable of the mining people (Doctor). They would all like their children educated if there are no fees to pay (Officiating Manager).<br>The higher and better class of people would like their children educated (Tahsildar).<br>*Mohpani.*—Many would, but many are as yet indifferent (Manager).<br>*Singareni*—Yes (Manager). Telugus do not appear to have much idea of education, and they are the people that have most of the children here (Doctor). |
| 2. Are there sufficient schools for this? | 2. *Umaria.*—There appear to be sufficient schools (Doctor).<br>There are sufficient schools (Officiating Manager).<br>There are sufficient schools, and would recommend that they be educated up to middle school standard (Tahsildar). There are sufficient schools (Contractor).<br>*Mohpani.*—Yes, but there would be more if the demand should arise (Manager).<br>*Singareni.*—No. There is a Mission School, but the majority of the people would prefer a school apart from this on account of religious principles (Manager).<br>Mohammedans have their children taught at the Mosque. A few children are taught by the Roman Catholics (Doctor). |
| 3. What would be the probable effect of this education in relation to their work? | 3. *Umaria.*—A little education would help them with their work. But education gives them higher notions, and makes them ask for more respectable work (Doctor). |

| Question. | Answer. |
| --- | --- |
| | They would all strike work at once and refuse to follow father's profession, but look out for Government Clerkships. (Officiating Manager). If they were well educated, they would be anxious to receive better appointments (Tahsildar). They would not follow father's profession (Contractor). |
| | *Mohpani.*—It would cause the rising generation to try for any kind of light work rather than manual labour and would tend to reduce the supply of labour. In the case of mechanics, etc., this would not be so marked (Manager). |
| | *Singareni.*—It would be a great help to them, and I cannot foresee any ill-effects that it would cause relative to their work (Manager). |
| | When a native gets educated, manual labour is thought to be beneath him (Doctor). |
| 4. At what age ought boys to be allowed to begin working in the mines? | 4. *Umaria.*—Most boys become a little intelligent by about 10 years of age (Doctor). |
| | May begin work from 12 to 14 years (Officiating Manager). From 14 years (Tahsildar). |
| | From 12 years (Contractor). |
| | *Mohpani.*—At 10 years of age (Manager). |
| | *Singareni.*—Not under 10 years of age (Manager). 10 years (Doctor). |
| 5. Ought females to be allowed to work in the mines? | 5. *Umaria.*—I do not know of any objections to females working in mines (Doctor). |
| | Yes; it depends a good deal on the mine where they have to work (Officiating Manager). |
| | Yes; women may work in the mines (Tahsildar). Yes (Contractor). |
| | *Mohpani*—Yes, for some time to come yet until western methods of mining are to some better extent appreciated by the miners, and until the social condition of the people generally is further advanced (Manager). |
| | *Singareni.*—Yes (Manager). Yes (Doctor). |
| 6. If females are employed in the mines at what age ought they to be allowed to begin working? | 6. *Umaria.*—Twelve years would be a nice age (Doctor). May begin work from 14 years (Officiating Manager). |
| | May be allowed to begin work from 12 years (Tahsildar). Begin work from the age of 12 years (Contractor). |
| | *Mohpani.*—At 12 years of age (Manager). |
| | *Singareni.*—Not under 10 years, but preferably 12 (Manager). About 12 years (Doctor). |
| 7. What are the advantages of females working in the mines, and what can be said in favour of such employment? | 7. *Umaria.*—They are relatives of male workers who cannot afford to keep them, and there is not sufficient other work (Doctor). They add to the income of the household; and are under the eye of the male relatives (Officiating Manager). They help to increase the income of the household, and there is no |

Question.

Answer.

other work for them (Tahsildar). The males cannot afford to keep them and so they have to work in the mines (Contractor).

*Mohpani.*—They are far more industrious at light work than the men. Being of lower stature they are better adapted for carrying loads on the head, and they require less wages than men. They are more amenable to orders, and generally more willing and quicker than men in doing certain classes of work easily which are difficult to men, such as stooping for filling, and carrying, etc., (Manager).

*Singareni.*—The chief advantage is that their labour costs less than men and the work seems to suit them admirably. Now English and Indian machine made products are put so cheaply in the market, it has done away with a lot of ordinary village labour such as weaving, dyeing, and many others, and in a case of a district where famines are prevalent, mines keep many from starvation (Manager).

They get more money for the family. All the lower class native females (except Mohammedans) do some work, if not at the mine, they all get other work; but get more money at the mine. And at some times of the year there is not enough work on the surface whereas the mine work is regular (Doctor).

8. What are the objections to females working in the mines, and what can be said against such employment?

8. *Umaria.*—I do not know of any objection (Doctor).

No objections, if it is a safe mine (Officiating Manager).

*Mohpani.*—That they cannot take care of themselves as well as men, and therefore require to be only employed in charge of men, and in the places most free from danger. That they can only be employed at such work as carrying, baling, etc., and other off-hand work, but not in actual production work, such as coal hewing. They cannot of course work amongst machinery well, and in fact are never so employed. They cannot be, and are not, employed in timbering, blasting, or any such work (Manager).

*Singareni.*—I know of nothing objectionable, nor can I say anything against such employment (Manager).

I do not know of any objection (Doctor).

9 Does female employment in the mines affect the morals of the people; if so, how?

9. *Umaria.*—I do not think it does affect the morals (Doctor). It does not affect the morals as far as I can judge (Officiating Manager). If the women are good, it does not affect their morals (Tahsildar). It does not affect, and I have never heard of any wrong (Contractor).

*Mohpani.*—To some extent it does. It roughens and coarsens women in many cases and makes them less gentle and less modest.

| Question. | Answer. |
| --- | --- |
| | This, however, applies to all labour, whether as in the case of our female farm labour in England or as in that of field labour or other surface labour in India. Mining labour probably varies only in *degree* from other classes of labour in the above effects (Manager). |
| | *Singareni.*—Not in the least (Manager). The people are immoral, whether they work in the mine or not, and are not in that way affected by working in the mine (Doctor). |
| 10. What are the opinions of officials and European inhabitants as to the employment of females and young children in mines? | 10. *Umaria.*—Personally I know of no objections (Officiating Manager). |
| | *Mohpani.*—Officials find them very valuable for certain work and generally see no way just at present to do without them. The general feeling is that they would feel it hard to be refused work, and that there is no call from any point of view at present to do it. Their homes are not rich enough to enable them to be idle in any case (Manager). |
| | *Singareni.*—The European inhabitants here being nearly all connected with the mines, labour of this class is engaged by them daily, therefore I presume their opinions are in its favour (Manager). |
| 11. What are the opinions of respectable native inhabitants, male and female, on the subject? | 11. *Umaria.*—There are no expressions of opinion against it (Doctor). |
| | *Mohpani.*—There is a general feeling that it would be better for females to be free from any kind of labour if the males could earn sufficient to keep up the homes, but this applies both to mining labour and to general surface labour of all kinds. It is generally admitted that female labour is still a necessity. But it is generally felt that mining labour is more degrading owing to its roughness for women (Manager). |
| | *Singareni.*—They consider it a boon for the male and female poorer classes, to enable them to earn an honest livelihood (Manager). |
| 12. What are the opinions of the females themselves who do work in the mines? | 12. *Umaria.*—Never heard any complaints against it of any kind (Doctor). They are very glad to work in the mines (Tahsildar). Never heard any complaints (Contractor). |
| | *Mohpani.*—Those who have been brought up to it will come to it as readily as to any other kind of work. Others always prefer surface work. They all look upon pit work as the hardest, but they would not give it up unless they had other means of earning a living (Manager). |
| | *Singareni.*—None (Manager). They rather like it than otherwise. They would consider it a great hardship if they were prevented from working in the mines, especially as there is but little of other work for them to do (Doctor). |
| 13. What are the opinions of the men who work in the mines? | 13. *Umaria.*—Never had any complaints. (Tahsildar and Contractor). |

Question.

Answer.

*Mohpani.*—Men always consider it more respectable for their women folk not to have to work at all. They do not send them down the mines of choice except where they have been brought up to it. They would not send their women willingly into the mines unless they were there to work with them. Generally speaking they would rather keep women out of the pit (Manager).

*Singareni.*—I have never heard them raise any objections, but on the other hand, they try to promote it (Manager). It is probable that they never think about it in any way (Doctor).

14. What latrine accommodation is there set apart specially for females working at the mines?

14. *Umaria.*—There is separate latrine accommodation for males and females on the surface (Doctor). None below ground, special latrines on the surface for females (Officiating Manager).

*Mohpani.*—None. They retire to any quiet spot that is not shut off, and we keep sweepers who go round the pits below ground and clean up. The general practice, however, is for all to use the jangals, etc., for latrines before entering, or after leaving the mine, so far as possible (Manager).

*Singareni.*—None below ground; but they voluntarily choose some portion of the old workings, which is cleaned up daily by a staff engaged for this purpose (Manager).

On the surface there are 18 latrines, and 6 others being erected each latrine has 5 seats.

They are all of the Crawford privy type. Twelve of the latrines are for females only and are quite separate from those used by the males (Doctor).

15. Do females work with males that are not related to them, or where there are no other females working, or under what conditions do they work?

15. *Umaria.*—Often work in gangs under a female mate, and do similar work as on surface loading and carrying coal, etc. (Officiating Manager).

They are not particular and will work with any one (Tahsildar and Contractor).

*Mohpani.*—Females never work with men alone. They sometimes carry coal for men not related to them and in such cases go into their working places for their coal. A woman would be going backwards and forwards between the station where other women are also carrying to. Men and women never work together in solitary pairs. In cases where a place is some distance from any other working place there would of course be facility for the intimacy suggested by this question to arise. But both men and women themselves say that women are quite safe from any molestation by the men, and that it is only where any two parties of opposite sexes agree to have improper

Question. Answer.

intercourse that such could occur to any greater extent than outside the mine (Manager).

*Singareni.*—Yes, in many cases, but seldom alone. They usually work in gangs of 4, 5, or more; generally families comprising mother, daughter, and near relatives (Manager).

*Note.*—The foregoing replies are valuable, because they represent the result of much experience; and in some cases, as at Mohpani, enquiries were made from various classes of people and the replies framed to represent the various views expressed.

## 17. REGISTRATION OF FEMALES AND CHILDREN.

If a system of registration of females and young children should be adopted, it would be well for some person to be appointed at each mine to make it a part of his *duty* to keep the register and to make the entries, and generally see that the register was a true and complete record. The immediate employers of females and young children might be required to give to the person appointed all the particulars required for registration, either before employing the females and children or at the time of first employment.

If a notice was thought to be necessary it might be of a form something as follows:—

REGISTRATION OF FEMALES AND YOUNG CHILDREN.

Notice as to the person to whom any female or any boy under 12 years of age must be taken by their immediate employer for registration.

Mine._____

Manager._____

The Manager of this mine hereby gives notice that he has appointed **Bábú Dás Chunder Dutt, Clerk in the pay office,** as the person to whom all feamles and boys under 12 years of age must be taken by their immediate employer, for registration, before being actually employed.

**WILLIAM ROBINSON,**

***Manager.***

## Registers.

*The following is the result of enquiries as to the registration of boys and females.*

| Name of Mine or Colliery. | Registers kept of— | | | | Remarks. |
|---|---|---|---|---|---|
| | Name. | Age. | Residence. | Date of first employment. | |
| 1 | 2 | 3 | 4 | 5 | |
| 1. Serampore | Yes. | Yes. | Yes. | ... | |
| 2. Kurharbaree | Yes. | Yes. | Yes. | ... | |
| 3. Raniganj Coal Association, Giridih. | | No registers kept. | | | |
| 4. Mudhabpur Colliery | Yes. | ... | Yes. | ... | |
| 5. Nimcha | | Not kept. | | | |
| 6. Laikdee | | Not kept. | | | |
| 7. Sodepore | Yes. | ... | Yes. | ... | |
| 8. Sanctoria | Yes. | ... | Yes. | ... | |
| 9. Kendua | | Not kept. | | | |
| 10. Singaren Valley Coal Concern. | | Not kept. | | | |
| 11. Damuda Coal Company | | Not kept. | | | |
| 12. Borrea Colliery | Yes. | No. | Yes. | No. | |
| 13. Belrooi Colliery | Yes. | No. | Yes. | No. | |
| 14. Dhadka „ | Yes. | No. | Yes. | No. | |
| 15. Desherghaf „ | | Not kept. | | | |
| 16. Luchipore „ | | Not kept. | | | |
| 17. Baraboni „ | | Not kept. | | | |
| 18. Sibpore „ | | Not kept. | | | |
| 19. Kuldiah „ | ... | ... | ... | ... | |
| 20. Munghulpur „ | | Not kept. | | | |
| 21. Roghnath Chak Colliery. | | Not kept. | | | |
| 22. Searsole Colliery | | Not kept. | | | |
| 23. Charanpore | Yes. | ... | Yes, of some. | | |
| 24. Mooduncotta | | Not kept. | | | |
| 25. Bayra Colliery | | Not kept. | | | |
| 26. Warora „ | No. | No. | No. | No. | No, except what is shown on the pay sheets. |
| 27. Mohpani | Yes. | No. | Partly. | Yes. | |
| 28. Umaria Colliery | No. | No. | No. | No. | The contractor keeps a register of all persons employed by him under 12 years of age. |
| 29. Singareni „ | Yes. | No. | No. | Yes. | |
| 30. Gold Fields of Mysore Mines. | ... | ... | ... | ... | |
| 31. Nine Reefs Mine | ... | ... | ... | ... | |
| 32. Balaghat | ... | ... | ... | ... | |
| 33. Coromandel Gold Mines. | Yes. | ... | ... | Yes. | |
| 34. Tank Mine | Yes. | ... | ... | Yes. | |
| 35. Nundydroog Mine | ... | ... | ... | ... | |
| 36. Oorgaum | Yes, of those on daily pay. | No. | No. | Yes. | |
| 37. Champion Reef | ... | ... | ... | ... | |
| 38. Mysore Mine | ... | No. | No. | No. | |
| 39. S. E. Mysore Mine | Yes. | No. | No. | Yes. | Also date of leaving. |
| 40. Mysore Reef | Yes. | No. | No. | Yes. | Ditto. |
| 41. Honnali | ... | ... | ... | ... | |
| 42. Kempinkote | ... | ... | ... | ... | |

## 18.—PAYMENTS.

*The following are particulars of times of payments.*

| Name of Mine or Colliery. | Number of persons employed | | When or how often paid at mines not paying oftener than weekly. | Remarks. |
|---|---|---|---|---|
| | Above ground. | Below ground. | | |
| 1 | 2 | 3 | 4 | 5 |
| 1. Serampore | 957 | 1,187 | Weekly. | |
| 2. Kurhurbaree | 1,209 | 1,409 | Do. | |
| 3. Raniganj Coal Association Giridih Mine | 444 | 420 | Weekly at Colliery Office. | |
| 4. Mudhabpur | 295 | 301 | ..... | Paid daily. |
| 5. Nimcha | 471 | 771 | ..... | Do. |
| 6. Laikdee | 730 | 489 | Establishment monthly; Some Labourers weekly. | Hewers daily. |
| 7. Sodepore | 163 | 377 | ..... | Paid daily. |
| 8. Sanctoria | 699 | 1,100 | ..... | Do. |
| 9. Kendua | 127 | 144 | ..... | Do. |
| 10. Singaren Valley Coal Concern | 26 | 129 | ..... | Do. |
| 11. Damuda Coal Company | 462 | 878 | ..... | Do. |
| 12. Borrea Colliery | 352 | 1,198 | ..... | Do. |
| 13. Belrooi | 76 | 225 | ..... | Do. |
| 14. Dhadka Colliery | 322 | 530 | ..... | Do. |
| 15. Desherghar Colliery | 420 | 910 | ..... | Do. |
| 16. Luchipore „ | 210 | 540 | ..... | Do. |
| 17. Baraboni „ | 80 | 107 | ..... | Do. |
| 18. Sibpore „ | 345 | 503 | ..... | Do. |
| 19. Kuldiah „ | 644 | 1,904 | Weekly. | |
| 20. Munghulpur „ | 32 | 58 | ..... | Do. |
| 21. Roghunath Chak Colliery | 83 | 81 | ..... | Do. |
| 22. Searsole | ... | ... | Weekly. | |
| 23. Charanpore | 176 | 331 | Monthly those on fixed wages. | Hewer and other coolies paid daily. |
| 24. Mooduncotta | 257 | 303 | Weekly. | |
| 25. Bayra | 31 | 69 | Do. | |
| 26. Warora | 694 | 889 | Weekly and monthly. | |
| 27. Mohpani | 237 | 298 | Fortnightly. | |
| 28. Umaria Colliery | 438 | 1,036 | Monthly for Government employés. Fortnightly for Contractor's men. | |
| 29. Singareni | 672 | 3,687 | Monthly. | |
| 30. Gold Fields of Mysore Mine | 88 | 120 | Do. | |
| 31. Nine Reefs Mine | 95 | 120 | Do. | |
| 32. Balaghat „ | 245 | 758 | Do. | |
| 33. Coromandel Gold Mine | 160 | 160 | Do. | |
| 34. Tank Mine | 150 | 100 | Do. | |
| 35. Nundydroog Mine | 722 | 1,236 | Do. | |
| 36. Oorgaum | 1,126 | 1,440 | Do. | |
| 37. Champion Reef | 944 | 1,327 | Do. | |
| 38. Mysore Mine | 1,377 | 1,500 | Do. | Some part of the Contractor's mens' pay is in the form of food supplied during the month. |
| 39. S. E. Mysore Mine | 225 | 145 | Do. | |
| 40. Mysore Reef | 135 | 100 | Do. | |
| 41. Honnali | 20 | 20 | Do. | |
| 42. Kempinkote | 109 | 78 | Do. | |

# 19.—CASTES AND NATIONALITIES.

## SINGARENI COLLIERY, HYDERABAD (DECCAN).

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mine. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | BELOW GROUND. | | | |
| 1 | Paradési | Kachi | Cultivators | Coal cutters | Hindustani. | |
| | „ | Lodh | Ditto | Ditto | Ditto. | |
| | „ | Pasi | Ditto | Ditto | Ditto. | |
| | „ | Chamar | Boot-makers, etc. | Ditto | Ditto. | |
| | „ | Brahmin | Cultivators | Ditto | Ditto. | |
| | „ | Takoor | Ditto | Ditto | Ditto. | |
| | „ | Kori | Ditto | Ditto | Ditto. | |
| | „ | Koombi | Ditto | Ditto | Ditto. | |
| | „ | Lohar | Labourers | Ditto | Ditto. | |
| | „ | Amer | Cultivators | Ditto | Ditto. | |
| | „ | Gadaria | Ditto | Ditto | Ditto. | |
| | „ | Navoo | Labourers | Ditto | Ditto. | |
| | „ | Komar | Ditto | Ditto | Ditto. | |
| | „ | Tali | Ditto | Ditto | Ditto. | |
| 2 | Telugu | Telugu | Cultivators | Ditto | Telugu. | |
| | „ | Chamar | Boot-makers and Cultivators. | Ditto | Ditto. | |
| | „ | Dhad | Labourers | Ditto | Ditto. | |
| | „ | Dhobee | Washing clothes | Ditto | Ditto. | |
| | „ | Capa | Cultivators | Ditto | Ditto. | |
| 3 | Maharatta | Marata | Labourers | Ditto | Maharatta. | |
| 4 | Mohammedans | Mohammedan | Ditto | Ditto | Hindustani. | |
| | Paradési | Takoor | Cultivators | Fillers and Trammers. | Ditto. | |
| | „ | Soodra | Oil manufacturers | Ditto | Ditto. | |
| | Telugu | Telugu | Labourers | Ditto | Telugu. | |
| | „ | Dhad | Ditto | Ditto | Ditto. | |
| | „ | Chamar | Boot-makers and Cultivators. | Ditto | Ditto. | |
| | „ | Bhoe or Bestha | Fishing and cultivation. | Ditto | Ditto. | |
| | „ | Capa | Cultivators | Ditto | Ditto. | |
| | „ | Christian | Ditto | Ditto | Ditto. | |
| | Mohammedan | Mohammedan | Labourers | Ditto | Hindustani. | |
| | Telugu | Telugu | Cultivators and labourers. | Sundry work | Telugu. | |
| | „ | Chamar | Boot-makers, etc. | Ditto | Ditto. | |
| | „ | Dhad | Labourers | Ditto | Ditto. | |
| | „ | Reddi | Ditto | Ditto | Ditto. | |
| | „ | Golla | Gheeman and shepherd. | Ditto | Ditto. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mine. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | BELOWGROUND. | | | |
| | Telugu | Wuddar | Excavating | Sundry work | Telugu. | |
| | „ | Salavad | Weaving and cultivation. | Ditto | Ditto. | |
| | „ | Naidu | Cultivation | Ditto | Ditto. | |
| | „ | Quawad | Ditto | Ditto | Ditto. | |
| | „ | Mangalavad | Cutting hair | Ditto | Ditto. | |
| | „ | Beshta and Baya. | Fishing and cultivation. | Ditto | Ditto. | |
| | „ | Christian | Cultivation | Ditto | Ditto. | |
| | „ | Dursee | Tailors, etc. | Ditto | Ditto. | |
| | „ | Kutikvadoo | Butchers | Ditto | Ditto. | |
| | „ | Numnoora | Cultivation | Ditto | Ditto. | |
| | „ | Dhobee | Washing clothes | Ditto | Ditto. | |
| | Mohammedan | Syed | Cultivation | Ditto | Hindustani. | |
| | „ | Shaik | Ditto | Ditto | Ditto. | |
| | „ | Mohammedan | Ditto | Ditto | Ditto. | |
| | „ | Pathan | Ditto | Ditto | Ditto. | |
| | „ | Thothaka | Spinning | Ditto | Ditto. | |
| | Paradési | Soodra | Oil and toddy drawers. | Ditto | Ditto. | |
| | „ | Dhad | Labourer | Ditto | Ditto. | |
| | „ | Brahmin | Cultivation | Ditto | Ditto. | |
| | „ | Takoor | Peon | Ditto | Ditto. | |
| | „ | Golla | Cultivation | Ditto | Ditto. | |
| | Maharatta | Boojna | Merchant | Ditto | Maharatta. | |
| | „ | Chamar | Boot-making, etc. | Ditto | Ditto. | |
| 5 | Tamil | Christian | Cultivation | Ditto | Tamil. | |
| | Maharatta | Dhad | Ditto | Ditto | Maharatta. | |
| | Telugu | Gownala | Toddy-drawing | Ditto | Telugu. | |
| 5 | Mohammedan | Shaik | Labourers and firemen. | Pump-men and winch-men. | Hindustani. | |
| | Telugu | Chamar | Boot-makers and labourers. | Ditto | Telugu. | |
| | „ | Mangalavad | Barbers | Ditto | Ditto. | |
| | „ | Christian | Fireman | Ditto | Ditto. | |
| | „ | Dhad | Labourers | Ditto | Ditto. | |
| | „ | Bunnia | Ditto | Ditto | Ditto. | |
| | „ | Golla | Fireman | Ditto | Ditto. | |
| | „ | Mannoor | Ditto | Ditto | Ditto. | |
| 6 | Paradési | Amer | Labourer | Ditto | Hindustani. | |
| | „ | Bunnia | Fireman | Ditto | Ditto. | |
| | Eurasian | Christian | Labourer | Ditto | English. | |
| | Tamil | Golla | Ditto | Ditto | Tamil. | |
| | „ | Christian | Fireman | Ditto | Ditto. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mine. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | ABOVEGROUND. | | | |
| | Mohammedan | Shaik | Labourers | Banksmen, &c. | Hindustani. | |
| | „ | Pathan | Merchant | Ditto | Ditto. | |
| | „ | Syed | Peons, &c. | Ditto | Ditto. | |
| 7 | Lambady | Lambady | Labourers | Ditto | Ditto. | |
| | Paradési | Takoor | Ditto | Ditto | Ditto. | |
| | „ | Lohar | Ditto | Ditto | Ditto. | |
| | „ | Soodra | Oil manufacturers | Ditto | Ditto. | |
| | Telugu | Chamar | Labourers and boot-makers | Ditto | Telugu. | |
| | „ | Dhad | Cultivators and labourers | Ditto | Ditto. | |
| | „ | Dhobee | Washing clothes | Ditto | Ditto. | |
| | „ | Bunnia | Shop-keeper | Ditto | Ditto. | |
| | „ | Mangalavad | Hair-cutter | Ditto | Ditto. | |
| | „ | Bestha | Fishing and cultivation | Ditto | Ditto. | |
| | Maharatta | Dhad | Labourer | Ditto | Ditto. | |
| | | | MECHANICAL DEPARTMENT. | | | |
| | Telugu | Reddi | Labourers, &c. | Engine-drivers | Telugu. | |
| | „ | Naidu | Ditto | Ditto | Ditto. | |
| | „ | Dhad | Firemen | Ditto | Ditto. | |
| | Tamil | Christian | Labourers | Ditto | Tamil. | |
| | „ | Salawad | Driver | Ditto | Ditto. | |
| | Mohammedan | Pathan | Fireman | Ditto | Hindustani. | |
| | „ | Shaik | Labourers | Ditto | Ditto. | |
| | „ | Syed | Fireman | Ditto | Ditto. | |
| | Telugu | Dhad | Labourers | Fireman | Telugu. | |
| | „ | Chamar | Ditto, &c. | Ditto | Ditto. | |
| | „ | Mannoor | Ditto | Ditto | Ditto. | |
| | „ | Salavad | Weavers and labourers | Ditto | Ditto. | |
| | „ | Mangalavad | Labourers | Ditto | Ditto. | |
| | „ | Reddi | Ditto | Ditto | Ditto. | |
| | Mohammedan | Shaik | Ditto | Ditto | Hindustani. | |
| | „ | Syed | Ditto | Ditto | Ditto. | |
| | Tamil | Christian | Ditto | Ditto | Tamil. | |
| | Maharatta | Dhad | Ditto | Ditto | Maharatti. | |
| | Paradési | Do. | Fireman | Ditto | Hindustani. | |
| 8 | Chinaman | Christian | Fitter, &c. | Fitters, &c. | Ditto. | |
| | Paradési | Lodhi | Apprentices, &c. | Ditto | Ditto. | |
| | Telugu | Reddi | Ditto | Ditto | Telugu. | |
| | „ | Mamder | Ditto | Ditto | Ditto. | |
| | „ | Chamar | Ditto | Ditto | Ditto. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mine. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | ABOVEGROUND—*continued.* | | | |
| | | | MECHANICAL DEPARTMENT.—*continued.* | | | |
| | Telugu | Dhad | Apprentices, &c. | Fitters, &c. | Telugu. | |
| | Tamil | Moodlier | Ditto | Ditto | Tamil. | |
| | „ | Naidu | Painter | Ditto | Ditto. | |
| | „ | Christian | Apprentices, &c. | Ditto | Ditto. | |
| | Eurasian | Do. | Ditto | Ditto | Ditto. | |
| 9 | Goanese | Do. | Ditto | Ditto | Hindustani. | |
| | Mohammedan | Shaik | Ditto | Ditto | Ditto. | |
| | Telugu | Mangalavad | Ditto | Blacksmiths | Telugu. | |
| | „ | Chutty | Ditto | Ditto | Ditto. | |
| | „ | Tali | Labourers | Ditto | Ditto. | |
| | Mohammedan | Shaik | Apprentices, &c. | Ditto | Hindustani. | |
| | Tamil | Vanier | Ditto | Ditto | Ditto. | |
| | Paradési | Lohar | Apprentices, &c. | Ditto | Ditto. | |
| | Mohammedan | Shaik | Labourers | Strikers and bellows boys. | Ditto. | |
| | Telugu | Dhad | Ditto | Ditto | Telugu. | |
| | „ | Reddi | Ditto | Ditto | Ditto. | |
| | „ | Quawad | Cultivation | Ditto | Ditto. | |
| | „ | Chamar | Boot-making, &c. | All leather work | Ditto. | |
| | „ | Carpenter | Carpenters | Carpenters | Telugu. | |
| | „ | Salavad | Ditto | Ditto | Ditto. | |
| | „ | Quawad | Cultivation | Ditto | Ditto. | |
| | „ and Tamil | Christian | Carpenters | Ditto | Telugu and Tamil. | |
| | Mohammedan | Shaik | Ditto | Ditto | Hindustani. | |
| | Telugu | Dhad | Labourers | Coolies and sundry work. | Telugu. | |
| | „ | Golla | Ditto | Ditto | Ditto. | |
| | „ | Salavad | Ditto | Ditto | Ditto. | |
| | „ | Quawad | Cultivation | Ditto | Ditto. | |
| | „ | Chamar | Boot-making, &c. | Ditto | Ditto. | |
| | „ | Mangalavad | Labourers | Ditto | Ditto. | |
| | „ | Reddi | Ditto | Ditto | Ditto. | |
| | „ | Bestha | Fishing | Ditto | Ditto. | |
| | Mohammedan | Shaik | Labourers | Ditt | Hindustani. | |
| | „ | Syed | Ditto | Ditto | Ditto. | |
| | „ | Pathan | Ditto | Ditto | Ditto. | |
| | Maharatta | Dhad | Ditto | Ditto | Maharatta. | |
| | Tamil | Christian | Ditto | Ditto | Tamil. | |
| | Eurasian | Ditto | Ditto | Ditto | English. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mine. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | ABOVEGROUND.—*continued.* | | | |
| | Paradési . | Lodhi . | Labourers . . | Coolies and sundry work. | Hindustani. | |
| | ,, . | Sonar . | Ditto . . | Ditto . | Ditto. | |
| | Telugu . | Mehtar . | Sweepers . . | Sweepers . | Telugu. | |
| | | | SUNDRY SURFACE WORKERS. | | | |
| | ,, . . | Chamar . | Boot-making and cultivation. | Sundry surface labour. | Ditto. | |
| | ,, . . | Dhad . | Labourers . . | Ditto . | Ditto. | |
| | ,, . . | Bestha . | Fishing . . | Ditto . | Ditto. | |
| | ,, . . | Capa . | Cultivation . . | Ditto . | Ditto. | |
| | ,, . . | Salavad . | Weaving . . | Ditto . | Ditto. | |
| | ,, . . | Quawad . | Cultivation . . | Ditto . | Ditto. | |
| | ,, . . | Mangalavad . | Ditto . . | Ditto . | Ditto. | |
| | ,, . . | Golla . | Ditto . . | Dtto . | Ditto. | |
| | ,, . . | Telugu . | Ditto . . | Ditto . | Ditto. | |
| | ,, . . | Dhobee . | Ditto . . | Ditto . | Ditto. | |
| | ,, . . | Sonar . | Ditto . . | Ditto . | Ditto. | |
| | Mohammedan | Shaik . | Ditto . . | Ditto . | Hindustani. | |
| | ,, | Syed . | Ditto . . | Ditto . | Ditto. | |
| | Maharatta . | Dhad . | Ditto . . | Ditto . | Maharatti. | |
| | Paradési . | Kahar . | Ditto . . | Ditto . | Hindustani. | |
| | Eurasian . | Christian . | Miner . . . | Ditto . | English. | |
| 10 | Hindu . | Brahmin . | Cultivation . . | Ditto . | Telugu. | |
| | Tamil . | Christian . | Drummer . . | Ditto . | Tamil. | |

*The following are castes employed by the Bengal Coal Co., Ld. Their caste occupation, present work at mine, and languages spoken were not stated.*

| No. | Names of castes. | No. | Names of castes. | No. | Names of castes. | No. | Names of castes. |
|---|---|---|---|---|---|---|---|
| | BELOWGROUND. | | | | ABOVEGROUND. | | |
| 1 | Akoorah. | 30 | Kharia. | 1 | Barhee. | 32 | Koormee. |
| 2 | Barhee. | 31 | Marick. | 2 | Beldar. | 33 | Kahal. |
| 3 | Bowree. | 32 | Moochee. | 3 | Bowree. | 34 | Kharia. |
| 4 | Brahmin. | 33 | Mohowlee. | 4 | Bhogta. | 35 | Kaloo. |
| 5 | Baidya. | 34 | Meah. | 5 | Brahmin. | 36 | Lohar. |
| 6 | Bhooiya. | 35 | Mohammedan or Mussalman. | 6 | Baidya. | 37 | Marick. |
| 7 | Baniya. | 36 | Moodey. | 7 | Bhooiya. | 38 | Moochee. |
| 8 | Chamar. | 37 | Manjhi. | 8 | Chamar. | 39 | Meah. |
| 9 | Chasas. | 38 | Mahally. | 9 | Chasas. | 40 | Mohammedan or Mussalman. |
| 10 | Dosad. | 39 | Mehtur. | 10 | Chutars. | 41 | Moodey. |
| 11 | Dhobie. | 40 | Mallik. | 11 | Dosad. | 42 | Mehtur. |
| 12 | Dome. | 41 | Malls. | 12 | Dome. | 43 | Mallick. |
| 13 | Dhangar. | 42 | Mahatos. | 13 | Deswalee. | 44 | Mahatos. |
| 14 | Ghalwal. | 43 | Moosher. | 14 | Dhangar. | 45 | Moosher. |
| 15 | Gope or Gowalla. | 44 | Mala. | 15 | Ghatwal. | 46 | Mala. |
| 16 | Hazam. | 45 | Napit. | 16 | Gope or Gowalla. | 47 | Napit. |
| 17 | Haree. | 46 | Onuws. | 17 | Hazam. | 48 | Passee. |
| 18 | Hazras. | 47 | Passee. | 18 | Haree. | 49 | Palwar. |
| 19 | Jolahs. | 48 | Poojehur. | 19 | Hazras. | 50 | Panday. |
| 20 | Kahar. | 49 | Rajawar. | 20 | Hindus. | 51 | Rajowar. |
| 21 | Kole. | 50 | Rajput. | 21 | Jolah. | 52 | Rajput. |
| 22 | Koiree. | 51 | Roy. | 22 | Kahar. | 53 | Rout. |
| 23 | Kamar. | 52 | Soondy. | 23 | Kole. | 54 | Soondy. |
| 24 | Kalal. | 53 | Santhal. | 24 | Koiree. | 55 | Santhal. |
| 25 | Kandoo. | 54 | Sing. | 25 | Kamal. | 56 | Sing. |
| 26 | Korrahs. | 55 | Toorey. | 26 | Kalal. | 57 | Satgope. |
| 27 | Kayasta. | 56 | Talee. | 27 | Kandoo. | 58 | Toorey. |
| 28 | Koorme. | 57 | Tantee. | 28 | Kalwar. | 59 | Talee. |
| 29 | Kanoo. | | | 29 | Kaots. | 60 | Tantee. |
| | | | | 30 | Korrahs. | | |
| | | | | 31 | Kayasta. | | |

# CASTES AND NATIONALITIES.

## KOLAR MINES.

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mines. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | BELOWGROUND. | | | |
| | | Telugus . | Cultivators . | Underground and contract work. | Telugu. | |
| | | Tamils . . | Ditto . | Ditto . . | Tamil. | |
| | | Do. . . | ... | General work . . | Ditto. | |
| | Mohammedans | Mohammedans | Agriculture . | Mining . . . | Hindustani. | |
| | | Do. . | Various work. | All kinds of work . | Hindi. | |
| | | Do. . | ... | Engine-men, firemen, fitters, smiths, &c. | Hindustani, Tamil, and, Kanarese. | |
| | | Do. . | ... | Hand-drilling and clearing. | Tamil. | |
| | | Do. . | ... | Various mining work | Kanarese. | |
| | | Do. . | Traders . | Mining . . . | Hindustani. | |
| | | Do. . | ... | Almost everything . | Ditto. | |
| | | Lubbas . | Traders . | Mining . . . | Tamil. | |
| | Moplahs . | Mohammedans | Labourers . | Ditto . . . | Malayalam. | |
| | | Moplahs and Thiars. | Ditto and general work | Underground contract work for hand labour, stopeings, &c. | Ditto and Tamil. | |
| | Hindus . | Modliers . | Traders and labourers. | Carpenters, &c. . | Tamil. | |
| | Do. . . | Do. . . | Ryats . . | Mining . . . | Ditto. | |
| | Do. . . | Sudras . | Labourers . | Ditto . . . | Ditto. | |
| | Do. . . | Brahmins . | Landed proprietors. | Ditto . . . | Ditto. | |
| | | Naidus . | Ryats . . | Ditto . . . | Telugu and Kanarese. | |
| | | Wakalegahs . | Labourers . | Ditto . . . | Kanarese. | |
| | | Gondas . | Ryats . . | Ditto . . . | Tamil, Telugu, and Kanarese. | |
| | | Thiars . . | Carpenters . | Ditto . . . | Malayalam. | |
| | | Hindus . | ... | Various kinds of mining work. | Tamil. | |
| | Pariahs . | Christians . | Labourers . | Cooly . . . | Ditto. | |
| | Do. . . | Vanee . . | Ditto . | Mining . . . | ... | |
| | Do. . . | Pariahs . | Ditto . | Ditto . . . | Tamil, Telugu, and Kanarese. | |
| | | Do. . . | ... | Various kinds of mining work. | Hindustani. | |
| | | Do. . . | Any kind of work except scavenging; but a section of them do scavenging. | Domestic servants, sweepers, and almost any kind of work. | Tamil. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mines. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | BELOWGROUND—*contd.* | | | |
| | Indians | Pariahs | Anything | All kinds of work | Tamil. | |
| | ,, | Maharattas | Soldiers and merchants. | Ditto | Maharasty. | |
| | ,, | Vallala | Cultivators | Ditto | Tamil, Telugu, and Kanarese. | |
| | ,, | Vannier | Do. | Ditto | Tamil. | |
| | ,, | Kanarese | Do. | Timber-men, hitch-cutters, underground men, carpenters, bricklayers, etc. | Kanarese and Tamil. | |
| | ,, | Do. | ... | General work | Kanarese. | |
| | ,, | Chucklers | General work and sweepers. | Under ground general work and sweepers. | Telugu, Tamil, and Kanarese. | |
| | ,, | Mixed classes and Pariahs. | General work | Ditto and servants. | Ditto. | |
| | Madrasees | Kanarese | ... | Underground | Tamil. | |
| | ,, | Reddi | | | | |
| | ,, | Chettya | | | | |
| | Mysoreans | Balaya | ... | Ditto | Telugu. | |
| | ,, | Kshetria | | | | |
| | Malabari | Thiars | ... | Ditto | Malayalam. | |
| | ,, | Malayams | ... | Various kinds of mining work. | Ditto. | |
| | ,, | Shastras | Soldiers, teachers, and other occupations not laborious. | Labourers generally | Tamil. | |
| | ,, | Native Christians. | Labourers | Mining | Tamil and Singalese. | |
| | Eurasians | Protestants | Mechanics | Fitters and miners, timber-men and rock-drilling men. | ... | |
| | ,, | Catholics | Miners | Miners | ... | |
| | Indians | Eurasians | ... | Fitters, engine-drivers, and underground assistants. | English and various Indian languages. | |
| | English | ... | Mining | All kinds of work: all the principal work. | English. | |
| | Italians | ... | Do. | Do. Timber and rock-drilling men. | Do. and Italian. | |
| | Greeks | ... | Do. | Ditto | Greek and French. | |
| | | | ABOVEGROUND. | | | |
| | | Telugus | Cultivators | Contract work, fitters, clerks, etc. | Telugu. | |
| | | Tamil | Do. | Ditto | Tamil. | |
| | Mohammedans | Mohammedans | Labourers | Engine-drivers and firemen. | Hindustani. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mines. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | ABOVEGROUND—*contd.* | | | |
| | Mohammedans | Mohammedans | Labourers . | Coolies . . . | Hindustani. | |
| | ,, | Do. | Carpentry . | Carpenters . . | Ditto. | |
| | ,, | Do. | Cultivation . | Landers . . | Ditto. | |
| | ,, | Do. | Labourers . | Mistry . . . | Ditto. | |
| | ,, | Do. | ... | Writer . . . | Ditto. | |
| | ,, | Do. | Sepoy . . | Watchmen . . | Ditto. | |
| | Indians . | Do. | Various work | All kinds of work . | Hindí. | |
| | | Do. | Mechanics . | Engine-men, fire-men, fitters, smiths, etc. | Hindustani, Tamil, and Kanarese. | |
| | | Do. | ... | Hand-drilling and clearing. | Tamil. | |
| | | Do. | ... | Various mining work. | Kanarese. | |
| | | Do. | ... | Engine-drivers and stamp coolies. | Hindustani. | |
| | | Do. | ... | Bankers . . | Ditto. | |
| | | Do. | ... | Rock drillers and almost everything. | Ditto. | |
| | | Moplahs | ... | ..... | Malayalam. | |
| | | Do. | ... | Contract work . | Ditto. | |
| | | Do. and Thiars. | Labourers and general work | Ditto . | Do. and Tamil. | |
| | Mohammedans | Lubbas . | Traders . | Fitters' cooly . . | Tamil. | |
| | Hindus . | Maharattas . | Labourers . | Ditto . . | Maharatti. | |
| | Indians . | Do. . | Soldiers and merchants. | All kinds of work . | Ditto. | |
| | | Do. . | ... | Carpenter's cooly . | Ditto. | |
| | | Do. . | ... | Blacksmith and bellows boys. | Ditto. | |
| | | Do. . | ... | Hammer-men . | Ditto. | |
| | | Do. . | ... | Engine-drivers and firemen. | Ditto. | |
| | | Do. . | ... | Stamp coolies and coolies. | Ditto. | |
| | Hindus . | Modliers . | Labourers and traders. | Carpenters, etc. . | Tamil. | |
| | | Do. . | ... | Blacksmiths and coolies, hammer-men, bellows boys. | Ditto. | |
| | | Do. . | ... | Firemen, boilersmiths fitters, coolies, stamp coolies. | Ditto. | |
| | | Modliers . | ... | Bankers and coolies | Tamil. | |
| | Hindus . | Sudras . . | Labourers and agriculturers. | Carpenters, and smiths. | Telugu. | |
| | ,, . . | Do. . . | General labour | Masonry, etc. . | Ditto. | |
| | | Brahmins . | ... | Carpenter's cooly . | Kanarese. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mines. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | ABOVEGROUND—*contd.* | | | |
| | Hindus . | Brahmins . | ... | Bellows boys . . | Tamil. | |
| | . . . . | Do. . . | Priests . . | Mistris and clerical work. | Telugu. | |
| | . . . . | Naidus . | ... | Carpenters, blacksmiths, hammer-men, and bellows boys. | Ditto. | |
| | . . . . | Do. . . | ... | Engine-drivers, firemen, fitters, and fitter's coolies, stamp coolies. | Ditto. | |
| | . . . . | Wakalegahs . | ... | Carpenters . . | Kanarese. | |
| | . . . . | Gondas . | ... | Blacksmiths, hammermen, stamp coolies, coolies. | Telugu. | |
| | . . . . | Thiars . | ... | ? | ... | |
| | . . . . | Hindus . | ... | Various mining work | Tamil. | |
| | Pariahs . | Christians . | Labourers . | Cooly . . . | Ditto. | |
| | ,, . . | Pariahs . | Do. and servants. | Do. and servants . | Ditto. | |
| | Indians . | Do. . . | Anything . | All kinds of work . | Ditto. | |
| | ,, . . | Do. . . | ... | Various kinds of mining work. | Hindustani. | |
| | ,, . . | Do. . . | ... | Carpenter's cooly. | Tamil. | |
| | ,, . . | Do. . . | ... | Engine-driver, firemen, boiler smiths, fitters, cooly, stamp coolies, banker's coolies. | Ditto. | |
| | ,, . . | Do. . . | Any kind of work except scavenging, but a section of them do scavenging. | Servants (domestic); sweepers and almost any kind of work. | Ditto. | |
| | ,, . . | Vallalas . | Cultivators . | All kinds of work . | Ditto, Telugu and Kanarese | |
| | ,, . . | Vanniers . | Do. . | Ditto . . | Tamil. | |
| | ,, . . | Kanarese . | Do. . | Timbermen, hitch, cutters, carpenters, bricklayers, etc. | Kanarese and Tamil. | |
| | ,, . . | Do. . . | ... | Coolies and general work. | Kanarese. | |
| | ,, . . | Chucklers . | General work and sweepers | General work and sweepers. | Telugu, Tamil and Kanarese | |
| | ,, . . | Mixed classes and Pariahs. | General work | Ditto, and servants. | Ditto. | |
| | Mysoreans . | Ooparoo . | ... | Carpenters . . | Kanarese. | |
| | ,, . | Kunchi . | | | | |
| | ? . | Kurunbars . | ... | Coolies . . . | Telugu. | |
| | . . . . | Shastras . | Soldiers, teachers, and other occupations not labourious. | Labourers generally. | Tamil. | |

| No. | Nationalities. | Names of castes. | Caste and former occupation. | Present work at mines. | Languages spoken. | Remarks. |
|---|---|---|---|---|---|---|
| | | | ABOVEGROUND—*contd.* | | | |
| | | Vysiahs | Labourers and cultivators. | ..... | ... | |
| | | Shetrias | Soldiers | Blacksmiths | Hindustani. | |
| | | Native Christians. | ... | Carpenter's coolies | Cingalese. | |
| | | Do. | ... | Bellows boys | Tamil. | |
| | | Do. | ... | Engine-driver, firemen, fitter's coolies, stamp coolies, banker's coolies. | Ditto. | |
| | | Kamlas | ... | Carpenters, carpenters' coolies. | Ditto. | |
| | | Do. | ... | Blacksmiths, hammermen, bellows boys. | Ditto. | |
| | | Sirachararo | ... | Carpenters | Kanarese. | |
| | Malayams | Christians | Labourers | Firing | Malayalam. | |
| | ,, | Noirs | Do. | Cooly | Ditto. | |
| | ,, | Do. | Do. | Watchmen | Ditto. | |
| | ,, | Acharis | Smithy | Smithy | Ditto. | |
| | ,, | Malayams | ... | Various kinds of mining work. | Malayalam. | |
| | Eurasians | ... | ... | All kinds of work, clerks, etc. | English and various Indian languages. | |
| | Indians | Eurasians | ... | Fitters, engine-drivers. | English and Tamil principally. | |
| | English | ... | Mining | All kinds of work, all the principal work, Superintendents, millmen, etc. | English. | |

## 20.—Sanitation at Indian Mines.

| No. | Name of Mine. | Sanitation. Sweepers. Aboveground. Males. | Females. | Sweepers. Belowground. Males. | Females. | Latrines. Aboveground. Males. | Females. | Latrines. Belowground. Males. | Females. | Number of persons employed. Aboveground. Males. | Females. | Belowground. Males. | Females. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | Mysore reef | ... | ... | ... | ... | Have latrines. | Have latrines. | ... | ... | 120 | 15 | 100 | None |
| 2 | South-East Mysore | ... | ... | ... | ... | „ | „ | ... | ... | 206 | 19 | 145 | „ |
| 3 | Mysore Mine | ... | ... | 3 | ... | „ | „ | Have latrines. | ... | 1,271 | 106 | 1,500 | „ |
| 4 | Champion reef | ... | ... | 4 | ... | „ | „ | „ | ... | 786 | 158 | 1,327 | „ |
| 5 | Oorgaum | ... | ... | 6 | ... | „ | „ | „ | ... | 987 | 139 | 1,440 | „ |
| 6 | Nundydroog | ... | ... | 6 | ... | „ | „ | „ | ... | 634 | 88 | 1,236 | „ |
| 7 | Tank Mine | 2 | ... | ... | ... | 2 | 2 | ... | ... | 137 | 13 | 100 | „ |
| 8 | Coromandel | ... | ... | ... | ... | Have latrines. | Have latrines. | ... | ... | 145 | 15 | 160 | „ |
| 9 | Balaghat | ... | ... | 6 | ... | „ | „ | Have latrines. | ... | 243 | 2 | 758 | „ |
| 10 | Nine reefs | 3 | ... | ... | ... | „ | „ | ... | ... | 87 | 8 | 120 | „ |
| 11 | Gold-fields of Mysore | ... | ... | ... | ... | „ | „ | ... | ... | 86 | 2 | 120 | „ |
| 12 | Kempinkote | Have sweepers. | ... | ... | ... | „ | „ | ... | ... | 98 | 11 | 78 | „ |
| 13 | Honnali | ... | ... | ... | ... | ... | ... | ... | ... | 20 | None | 20 | „ |
| | | Each of the mines in Kolar have a number of latrines and a staff of sweepers that are supervised by the Medical Officer. | | | | | | | | | | | |
| 14 | Warora Colliery | 9 | 8 | ... | ... | 7 | 7 | ... | ... | 769 | 175 | 889 | None |
| 15 | Mohpani „ | 3 | ... | a few | ... | Have ten flag-stations for refuse. | | | | 206 | 37 | 216 | 82 |
| 16 | Umaria „ | 21 | 19 | 8 | ... | 6 | 3 | ... | ... | 387 | 51 | 942 | 94 |
| 17 | Singarer „ | 35 | | 10 | | 12 | 12 | ... | ... | 627 | 45 | 3,061 | 626 |
| | | Also 6 rangers to secure the latrines being regularly used. | | | | In addition to dustbins, incinerators, three rubbish carts, and one night-soil cart. | | | | | | | |

## 21.—ACCIDENTS AT INDIAN MINES.

One of the peculiarities an Inspector of mines meets with, not at all less in India than elsewhere, and both amongst officials and workmen, is, that their actions, and even their words, give indications that they little realise that like causes will generally produce something like similar effects both in India and all the world over; but on the contrary they do things, propose to do things, and allow things to be done that are generally forbidden by mining rules, and fully recognised to be dangerous. And when this is pointed out to them, they reply by referring to the fewness of the accidents that have happened at their own colliery from such causes. But a reference to the following statements shows clearly that mining accidents in India are not in any sense few in number, and when compared with the number of persons employed, as on pages 151 and 153, they come out unusually large as compared with other countries. There are certainly too many accidents in India—too many as compared with the number of persons employed, as compared with the output or as compared with the dangers of the mines or of the work, and I do not hesitate to say that there are more accidents than there would be if only all the ordinary precautions were taken to guard against and avoid the well-known and recognised dangers. Amongst the many ways that I have found danger being nothing less than courted in Indian mines, I may well mention (1) the dangerous handling and dealing with explosives, and in close proximity to naked lights; (2) the careless and unsafe way of carrying explosives; (3) the dangerous positions in which explosives are placed and allowed to remain in the mine; (4) stemming of blasting charges with small coal, and with an iron tamping rod; (5) dangerous proceedings when lighting shots; (6) going back too soon after shots are fired, and failing to examine the place and secure it before beginning to work; (7) going back too soon to a shot that is hanging fire; (8) unramming misfired shots; (9) failing to examine for fire-damp, but continuing to work and go with naked lights without precautions where fire-damp might at least be suspected; (10) the refusal of workmen to do anything towards securing their own working-places, even when they are themselves making the places unsafe by the work they are doing; (11) beginning to work where it is not safe, or continuing to work in such places; (12) unfenced shafts, and doing most dangerous things in and about mine shafts.

All such matters have come directly under my observation when inspecting; in many cases my attention has been drawn towards the practices by accidents, and accidents will frequently happen so long as such practices prevail, without there being any mining rules to prohibit them and give force to an official's directions; in fact, the danger is so great in some cases that it is more a wonder that the accidents are not more frequent. One has had occasionally to point out that, although the accidents at that particular part may possibly have been few in the past, the possibilities of the future in this direction were being forgotten, as well as the idea that if a person knowingly allows a dangerous thing or practice to continue, and over which he has full and special control, and a person loses his life by it, the person who wilfully neglected or refused to remedy the danger had really done little short of committing wilful murder. Some unfenced and very dangerous shafts that I have met with, some

matters connected with the use of explosives that have come prominently before me, and matters having reference to ladders, and the means for going into and out of the mines, fall under this class.

Investigation of accidents—

Much has been said by managers, during my inspections, as to the so-called obnoxious investigation of accidents by mining novices, and the necessity for it being properly done, if done at all, so that the whole of the circumstances may be properly understood. The peculiarities of mining, and the often awkward situations, make it necessary to have a comprehensive and peculiar knowledge of all the details of mining work to be able to investigate the causes of accidents thoroughly, efficiently, and beneficially. A general knowledge is not sufficient; in fact such knowledge often fails by leading to hasty conclusions: what is necessary is such an inbred knowledge of details that every act and movement, and the reasons for every little thing done, can not only be comprehended when explained, but fully realised as well. It may well be looked upon that the principal object of mining rules and regulations, and of the appointment of Inspectors of mines, is to keep down and reduce the number of preventible accidents as far as that is possible. When an Inspector is examining the place of an accident, and making most careful and critical enquiries as to its cause, the object is not, as some officials and workmen think, with a view to attaching blame to some one or more persons so as to bring them under the penalties of the law, but the chief aim and object is to find out exactly how the accident happened; all the actions and changes that had caused or tended to cause it; all the peculiarities which led to the persons being injured; how all these can best be guarded against and avoided in the future; and how persons can be best safeguarded, whether the causes and like occurrences can be avoided or not. For this to be effective, the Inspector should be made acquainted with the occurrence of an accident or other thing requiring his attention as soon as possible, and the place should, if not greatly inconvenient, be left just as it was at the time of accident, if the inspection and inquiry be not delayed inconveniently long. The very essence of an Inspector of mines' existence is to keep down the number of accidents to the lowest possible limit, and his extensive and varied mining experience and frequent investigations fit him well for this, and he may often be able to give valuable help and advice in that direction. An accident that happened about the middle of last year, by which a number of men lost their lives by an explosion of fire-damp, formed one of the many proofs of the necessity for definite mining rules to guide and regulate mining people, as well as those in charge of districts, for that most serious accident that might easily have been followed by others has never been officially reported to me. I happened to be at the time in a position for readily getting to the place, but for many days after I knew nothing more of the occurrence than was contained in a very small newspaper paragraph. Another case in point was the slight accident from fire-damp at the East Indian Railway Company's Colliery at Giridih. In this case Dr. Saise, the Manager, did write to tell me of the accident a few days after it happened; and I was officially informed of it about two months after.

# Number of persons killed by mining accidents in India during the year 1894.

Deaths.
District.
Kind of mine.
Place of accident.
Cause of accident.
Remarks.

| No. | State, Province, Division, or District. | Mineral. | Falls in Mine. | | | | In Shafts. | | | | | | | | | Miscellaneous Belowground. | | | | | | | | | | On Surface. | | | | | GROSS TOTALS. | Remarks on accidents. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Falls of roof, stone, or coal. | Falls of sides. | Falls of coal in working places. | Total Falls. | Overwinding. | Ropes and chains breaking. | Whilst ascending or descending by machinery. | Falling into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in shafts. | Explosions of fire-damp. | Suffocation by gases. | By explosives. | Irruptions of water and falling into water. | On inclined and engine planes. | By trams or tubs. | By machinery. | By other causes. | Total { Miscellaneous below ground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | Total on surface. | | |
| | Bengal. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Burdwan Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Burdwan District | Coal. | ... | .. | 1 | 1 | ... | 2 | 3 | 3 | 1 | ... | 1 | ... | 10 | ... | ... | ... | ... | ... | 3 | ... | ... | 3 | 1 | ... | 1 | ... | 2 | 16 | The three deaths (in shafts whilst descending by machinery) were caused by one accident. They fell with the winding cage down 110 feet of the shaft. |
| | *Burdwan District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Raniganj Sub-Division | ,, | 4 | ... | 1 | 5 | ... | ... | ... | | ... | 1 | 1 | ... | 3 | 9 | ... | ... | ... | ... | 1 | ... | ... | 10 | ... | ... | ... | ... | ... | 18 | The nine deaths (by explosions of fire-damp) were caused by two accidents; six deaths by one, and three by the other. |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Hazaribagh District | ,, | 2 | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | .. | 1 | ... | ... | ... | 1 | ... | .... | ... | 1 | 2 | ... | ... | ... | 1 | 1 | 6 | |
| | *Hazaribagh District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Giridih Sub-Division | ,, | 3 | .. | ... | 3 | ... | ... | 1 | | ... | ... | | ... | 1 | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | 1 | 1 | 5 | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Manbhum District | ,, | 3 | ... | ... | 3 | ... | .. | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | |
| | Central Provinces. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Chanda District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Warora | ,, | 1 | 1 | ... | 2 | .. | . | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | 3 | |
| | *Rewah State.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Umaria | ,, | 2 | ... | . | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | 3 | |
| | Punjab. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Rawal Pindi Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Jhelum District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | This was supposed to be caused by carbon dioxide, $CO_2$. |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BELUCHISTAN. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Beluchistan District . . | Coal. | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 3 | |
| | HYDERABAD (DECCAN). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Yellandu, Singareni . . | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 2 | ... | ... | 1 | ... | ... | 3 | ... | ... | 4 | ... | ... | 3 | ... | 3 | 9 | |
| | BURMA (UPPER). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Shwebo District . . . | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | 1 | This accident was to a person who was not employed at the mine. |
| | ASSAM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Ledo Valley and Tikak . | ,, | ... | 5 | ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | 2 | 2 | 10 | (Explosions of fire-damp). These three deaths and one injured were by the same accident. |
| | COAL TOTALS . | | 17 | 6 | 2 | 25 | 1 | 2 | 4 | 4 | 1 | 1 | 2 | 2 | 17 | 13 | 1 | 1 | 1 | ... | 8 | ... | 2 | 26 | 1 | ... | 5 | 4 | 10 | 78 | |
| | HYDERABAD (DECCAN). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Raichur District . . . | Gold | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 2 | These two deaths were caused by the same accident. |
| | MADRAS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | North Arcot . . . . | ,, | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 2 | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 3 | The two deaths (by explosives) were caused by one accident. |
| | GOLD TOTALS . | | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 4 | ... | ... | ... | ... | ... | 4 | ... | ... | ... | ... | ... | 5 | |
| | TRAVANCORE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Vellanad . . . . | Plumbago. | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| | PLUMBAGO TOTALS . | | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| | BENGAL. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Hazaribagh District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Giridih Sub-Division . . | Mica. | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| | MICA TOTALS . | | 1 | ... | .. | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| | GROSS TOTALS . | | 18 | 7 | 2 | 27 | 1 | 2 | 4 | 5 | 1 | 1 | 2 | 2 | 18 | 13 | 1 | 5 | 1 | ... | 8 | ... | 2 | 30 | 1 | ... | 5 | 4 | 10 | 85 | It is not known how many of the accidents "By trams or tubs" were caused "On inclined and engine planes." |

# Number of persons seriously injured by mining accidents in India during the year 1894.

Seriously injured. | Place of accident.
District. | Cause of accident.
Kind of mine. | Remarks.

| No. | State, Province, Division, or District. | Mineral. | Falls in Mine. | | | | In Shafts. | | | | | | | | | Miscellaneous Belowground. | | | | | | | | | On Surface. | | | | | GROSS TOTALS. | Remarks on accidents. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Falls of roof, stone or coal. | Falls of sides. | Falls of coal in working places. | Total Falls. | Overwinding. | Ropes and chains breaking. | Whilst ascending or descending by machinery. | Falls into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in shafts. | Explosions of fire-damp. | Suffocation by gases. | By Explosives. | Irruptions of water and falling water. | On inclined and engine planes. | By trams or tubs. | By machinery. | By other causes. | Total (Miscellaneous below ground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | Total on Surface. | | |
| | **Bengal.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Burdwan Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Burdwan District | Coal | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | |
| | *Burdwan District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Raniganj Sub-Division | „ | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | 2 | ... | ... | ... | ... | ... | 4 | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Hazaribagh District | „ | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| | *Hazaribagh District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Giridih Sub-Division | „ | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Manbhum District | „ | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | 3 | |
| | **Central Provinces.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Chanda District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Warora | „ | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 | |
| | *Narsinghpur District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Mohpani | „ | 2 | 2 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 1 | 1 | 7 | (Explosions of fire-damp.) These two injuries were caused by the same explosion. |
| | *Rewah State.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Umaria | „ | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | 3 | ... | ... | 1 | ... | 1 | 4 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PUNJAB. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Rawalpindi Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Jhelum District . . . | Coal . | 6 | ... | ... | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | 2 | ... | ... | 1 | 1 | 2 | 10 | These numerous accidents appear to have happened at the Dandot Colliery, but place and dates were not fully given. |
| | BELUCHISTAN. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Beluchistan District . . | „ . | 4 | ... | ... | 4 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | 3 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | 8 | (Explosions of fire-damp.) These three injured and one killed were all caused by accidents at the same mine. |
| | HYDERABAD (DECCAN). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Yellandu, Singareni . . | „ . | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 5 | ... | ... | 1 | ... | ... | 6 | ... | ... | 1 | ... | 1 | 9 | |
| | BURMA (UPPER). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Shwebo District . . . | „ . | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 3 | 3 | 5 | |
| | ASSAM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Ledo Valley and Tikak . | „ . | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | |
| | COAL TOTALS . | | 19 | 2 | ... | 21 | ... | ... | ... | 1 | ... | ... | ... | 1 | 2 | 6 | ... | 5 | ... | ... | 6 | 6 | 1 | 24 | ... | ... | 3 | 5 | 8 | 55 | |
| | TRAVANCORE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Vellanad . . . . | Plumbago. | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 2 | |
| | PLUMBAGO TOTALS . | | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | 2 | |
| | GROSS TOTALS . | | 20 | 2 | ... | 22 | ... | ... | ... | 1 | ... | ... | ... | 1 | 2 | 6 | ... | 5 | ... | ... | 6 | 6 | 2 | 25 | ... | ... | 3 | 5 | 8 | 57 | It is not known how many of the accidents "By trams or tubs" were caused "On inclined and engine planes." |

## Accidents. India

*Number of males and females killed and seriously injured, classified as to causes.*

| No. | Causes of accidents in terms of "Form 25," and whether above or below ground. | Deaths. | | Serious Accidents. | | Total deaths. | Total seriously injured. | |
|---|---|---|---|---|---|---|---|---|
| | | Males. | Females. | Males. | Females. | | | |
| | **I.—Falls in Mine.** | | | | | | | |
| 1 | Falls of roof, stone, or coal | 14 | 4 | 19 | 1 | 18 | 20 | |
| 2 | Falls of sides | 6 | 1 | 2 | ... | 7 | 2 | |
| 3 | Falls of coal in working places | 2 | ... | ... | ... | 2 | ... | |
| | TOTALS FROM FALLS IN MINE | 22 | 5 | 21 | 1 | 27 | 22 | Falls. |
| | **II.—In Shafts.** | | | | | | | |
| 1 | Overwinding | 1 | ... | ... | ... | 1 | ... | |
| 2 | Ropes and chains breaking | 1 | 1 | ... | ... | 2 | ... | |
| 3 | Whilst ascending or descending by machinery | 4 | ... | ... | ... | 4 | ... | |
| 4 | Falling into shaft from surface | 4 | 1 | 1 | ... | 5 | 1 | |
| 5 | Falling from part way down | 1 | ... | ... | ... | 1 | ... | |
| 6 | Things falling from surface | ... | 1 | ... | ... | 1 | ... | |
| 7 | Things falling from part way down | 1 | 1 | ... | ... | 2 | ... | |
| 8 | Miscellaneous | 2 | ... | 1 | ... | 2 | 1 | |
| | TOTALS IN SHAFTS | 14 | 4 | 2 | ... | 18 | 2 | In shafts. |
| | **III.—Miscellaneous, Below Ground.** | | | | | | | |
| 1 | Explosions of fire-damp | 13 | ... | 6 | ... | 13 | 6 | |
| 2 | Suffocation by gases | 1 | ... | ... | ... | 1 | ... | |
| 3 | By explosives | 5 | ... | 5 | ... | 5 | 5 | |
| 4 | Irruptions of water and falling into water | 1 | ... | ... | ... | 1 | ... | |
| 5 | On inclined and engine planes | ... | ... | ... | ... | ... | ... | |
| 6 | By trams or tubs | 8 | ... | 5 | 1 | 8 | 6 | |
| 7 | By machinery | ... | ... | 6 | ... | ... | 6 | |
| 8 | By other causes | 2 | ... | 1 | 1 | 2 | 2 | |
| | TOTALS, MISCELLANEOUS BELOW GROUND | 30 | ... | 23 | 2 | 30 | 25 | Miscellaneous below ground. |
| | TOTALS BELOW GROUND | 66 | 9 | 46 | 3 | 75 | 49 | Totals below ground. |
| | **IV.—On surface.** | | | | | | | |
| 1 | By machinery | ... | 1 | ... | ... | 1 | ... | |
| 2 | Boilers and steam pipes bursting | ... | ... | ... | ... | .. | ... | |
| 3 | On railways and tramways belonging to mine | 4 | 1 | 3 | ... | 5 | 3 | |
| 4 | Miscellaneous | 3 | 1 | 5 | ... | 4 | 5 | |
| | TOTALS ON SURFACE | 7 | 3 | 8 | ... | 10 | 8 | Totals on surface. |
| | GROSS TOTALS ABOVE AND BELOW GROUND | 73 | 12 | 54 | 3 | 85 | 57 | Gross totals. |
| | | Males. | Females. | Males. | Females. | Males and Females. | Males and Females. | |

## Accidents.

Percentages from various causes—

A few of the percentages of the numbers and causes of accidents are as follows:—

1894.

I.—Falls in the mine—

The total deaths from falls in mine was 27; or 30 per cent. of all the deaths below ground; or 31·76 per cent. of all the deaths. Of these, there were 5 females killed, which is 18·51 of the total deaths by falls.

The particulars of the accidents from falls in the mine were not given in a way that the numbers for each cause could be given very accurately, though the totals should be accurate.

The total other serious accidents from falls in the mine were 22, of which one was to a female.

II.—In Shafts—

The total deaths in shafts was 18, or 24 per cent. of all the deaths below ground, or 21·17 per cent. of all the deaths. Of this total, 4 were females, or 22·22 per cent. of the total deaths in shafts.

Whilst ascending or descending by machinery 4 deaths, or 22·22 of the total deaths in shafts, or 5·33 of the total deaths below ground, or 4·70 of the total deaths.

Falling into shaft from surface 5 deaths, or 27·77 of the total in shafts, or 6·66 of the total below ground, or 5·88 of the total deaths. This appears to show that there has been a want of proper fencing.

There was a total of 2 serious accidents, not deaths, in shafts.

III.—Miscellaneous, below ground—

The total deaths by miscellaneous causes below ground was 30, or 40·00 per cent. of the total deaths below ground, or 35·20 per cent. of all the deaths.

There were also 25 other serious accidents from similar causes, 2 being to females.

Explosions of fire-damp caused the death of 13 persons, or 43·33 of the total from miscellaneous causes below ground, or 17·33 of the total deaths below ground, or 15·29 of the total deaths.

In addition to the 13 deaths there were 6 persons seriously injured by explosions of fire-damp.

Suffocation by gases caused one death; making a total of 14 deaths by mine gases.

By explosives five deaths were caused, or 16·66 of the total deaths by miscellaneous causes below ground, or 6·66 of the total for below ground, or 5·88 of all the deaths.

In addition to these, there were five other serious accidents by explosives.

By trams or tubs there were eight deaths, or 26·66 of the deaths by miscellaneous causes below ground, or 10·66 of the total below ground, or 9·41 of all deaths.

In addition to the deaths, there were six other serious accidents by trams or tubs.

The total serious accidents, other than deaths by miscellaneous causes below ground, was 25.

## IV.—On Surface—

There were ten deaths caused on surface, or 11·76 of the total deaths. Of these deaths three were females.

There were also eight other serious accidents, not deaths, caused on the surface at mines. On railways and tramways belonging to mine there were 5 deaths, or 50 per cent. of all deaths on the surface; and one of these was a female.

There were also three other serious accidents, not deaths, caused on railways or surface tramways.

## Comparison with the United Kingdom—

**Note.—The numbers of accidents at the Mysore mines are *not* included in these figures; if they were included, Indian mining would appear much blacker than the foregoing makes it.**

### TOTAL DEATHS, AND DEATHS FOR EVERY 1,000 PERSONS EMPLOYED.

UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.—NUMBER OF DEATHS AND DEATH-RATE PER 1,000 PERSONS EMPLOYED.

| Coal mines. Year. | From explosions of fire-damp. | | From falls in the mine. | | In Shafts. | | Miscellaneous accidents below ground. | | Total below ground. | | Total above ground. | | Cross total below ground and above ground. | | Number of persons employed per death from explosions of fire-damp. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total deaths. | Deaths per 1,000 employed below ground. | Total deaths. | Deaths per 1,000 employed below ground. | Total deaths. | Deaths per 1,000 employed below ground. | Total deaths. | Deaths per 1,000 employed below ground. | Total deaths. | Deaths per 1,000 employed below ground. | Total deaths. | Deaths per 1,000 employed above ground. | Total deaths. | Deaths per 1,000 employed below ground and above ground. | |
| 1893 . . | 160 | 0·287 | 412 | 0·749 | 103 | 0·187 | 265 | 0·481 | 940 | 1·709 | 120 | 0·900 | — | 1·060 | 3,435 |
| 1894 . . | 317 | 0·556 | 444 | 0·779 | 77 | 0·135 | 177 | 0·311 | 1,015 | 1·782 | 112 | 0·826 | | 1·127 | 1,797 |
| **INDIA.—NUMBER OF DEATHS AND DEATH-RATE PER 1,000 PERSONS EMPLOYED.** | | | | | | | | | | | | | | | |
| Coal mines. | | | | | | | | | | | | | | | |
| 1894 . . | 13 | 0·788 | 25 | 1·493 | 17 | 1·015 | 26 | 1·553 | 68 | 4·063 | 10 | 1·107 | 78 | 3·027 | 1,287 |

Remarks on accidents—

These numbers are given for comparison, and they deserve most serious consideration. Ever since I began the inspection work in India an effort has been made throughout and at almost every turn to impress me that the accidents at Indian mines were very few and far between, and that mine inspection and mining legislation for Indian mines was quite unnecessary and would be redundant. Though I have gone to a great deal of trouble and made every possible effort to get correct figures, they may possibly not be quite correct, especially as to the numbers of persons employed and all the calculations depending on that. I do not know actually that the figures given are incorrect, but the returns generally bore evidence of being something new and out of the ordinary course. But making all possible allowances, it appears that those persons who have hitherto believed that accidents at Indian mines were few, have been living in blissful ignorance of the facts. When the accidents at Indian mines for 1894, and from the several causes, are compared with the accidents in the United Kingdom for the same year, which was an unfavourable year for the United Kingdom, especially from explosions of fire-damp owing to a very large explosion, I can scarcely restrain myself from making use of what strikes me as a natural and applicable expression, namely, that the proportions of accidents to numbers of persons employed at Indian mines from explosions of fire-damp, and in fact from all the general causes, is really startling. Not only do the numbers look very bad indeed on paper when placed side by side with comparative numbers for the whole of the United Kingdom, but eight separate accidents from explosions of fire-damp, resulting in thirteen deaths and six other persons seriously injured, with only 174 coal mines and a total of about 25,768 persons employed at them, is something to think of after being accustomed to English inspection districts, with about 300 coal mines and over 40,000 employés in one district, and fire-damp given off regularly, and yet the whole of such a district goes for years together without a single death from fire-damp.

It may possibly be thought that I am looking rather keenly at the black side of this matter, but such a view appears to me to be necessary because I wish Indian mining people to see it from the black side in such a way as to lead them to a determination to bring about a more favourable comparison. There can be little question that not a single life should be lost that can be prevented; and from what I have already seen of Indian mines they ought to be worked safely. The coal is generally strong and safe; the roof is in most cases a strong and safe sandstone immediately above the coal, and falls of roof cause by far the greatest number of accidents in England and other countries; and there is really very little fire-damp in Indian mines, but it is so little guarded against that what little there is causes numerous accidents. If such accidents so freely happen now with fire-damp so comparatively rare, what may be expected to happen to such a very numerous quantity of inexperienced employés (as compared with the quantity of work done) when fire-damp is frequently present. At the present time there are very few persons indeed, other than European officials, who know anything at all of the properties and behaviour of fire-damp, and the consequences of the ignition of even a very small quantity; and most of those who

have learned a little about it have learned it from being injured by a small explosion, or had their friends killed by one. It follows then that at present only Europeans (and possibly a few natives with experience) can safely deal with fire-damp, and at present they are the only persons who should be allowed to deal with it; and I may mention here with all the force that it deserves, that legislation on this matter cannot be brought into force too soon.

## Fire-damp—

The following may be briefly mentioned as new appearances of fire-damp during the year:—

1. At the Nerbudda Coal and Iron Company's Mohpani Mine there were two men burned by an explosion of fire-damp on the 12th December 1894. Fire-damp had never been found before that time.

2. A man was burned by a small explosion of fire-damp, in March of 1895, at the East Indian Railway Company's Kurhurbaree Colliery, Giridih. Fire-damp had never been found there before.

Safety lamps were adopted temporarily at these mines after the accidents. There has been some difficulty in getting safety lamps quickly. There appear to be very few of a good type kept for sale in India, they have been so seldom required. It would be well if a few good safety lamps were always kept at each mine, but they should be kept in a good and clean condition. I have seen what should have been safety lamps kept at Indian mines and that were unsafe and of no use when they were most wanted; such lamps as those referred to may readily lead and contribute to serious accidents. I shall be glad to give any assistance to owners and managers who may wish to get a supply of good safety lamps at reasonable prices. I merely mention the price because it might be thought that I should recommend high-priced articles; but good serviceable lamps of recognised safety and utility may be bought as cheaply as the out-of-date Davy lamps kept at the Indian ironmongers' shops.

## Accidents—

The next form of stating the number of accidents in Indian mines during 1894, shows equally bad, especially when compared with the various statements following it with reference to mines, numbers employed, accidents, etc., in the United Kingdom of Great Britain and Ireland.

These English statements have been given thus fully in this report as a standard or basis of the time, and with which not only the present but the much hoped for future improvement can be compared.

## *Deaths.*

| No. | Districts or Provinces. | Description of mine. | TOTAL DEATHS. | | PERSONS EMPLOYED. | | | | | | | NUMBER OF DEATHS BY ACCIDENTS FOR EVERY 1,000 PERSONS EMPLOYED. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Above ground. | | Below ground. | | Totals employed. | | | | | | |
| | | | Above ground. | Below ground. | Males. | Females. | Males. | Females. | Above ground. | Below ground. | Above ground and below ground. | Number of deaths above ground for every 1,000 persons employed above ground. | Number of deaths below ground for every 1,000 persons employed below ground. | Number of deaths above and below ground for every 1,000 persons employed at the mines. | |
| 1 | Bengal | Coal | 4 | 44 | 4,026 | 2,813 | 6,869 | 2,187 | 6,839 | 9,056 | 15,895 | 0·58 | 4·85 | 3·02 | |
| 2 | Central Provinces | „ | ... | 6 | 481 | 79 | 2,059 | 169 | 560 | 2,228 | 2,788 | *Nil* | 2·69 | 2·15 | |
| 3 | Punjab | „ | ... | 1 | 71 | 1 | 50 | 1 | 72 | 51 | 123 | *Nil* | 19·60 | 8·13 | |
| 4 | Beluchistan | „ | ... | 3 | 325 | ... | 859 | ... | 325 | 859 | 1,184 | *Nil* | 3·49 | 2·53 | |
| 5 | Hyderabad (Deccan) | „ | 3 | 6 | 627 | 45 | 3,061 | 626 | 672 | 3,687 | 4,359 | 4·46 | 1·62 | 2·06 | |
| 6 | Burma (Upper) | „ | 1 | ... | 91 | 45 | 59 | 40 | 136 | 99 | 235 | 7·35 | *Nil* | 4·25 | |
| 7 | Assam | „ | 2 | 8 | 223 | 123 | 471 | 228 | 346 | 699 | 1,045 | 5·78 | 11·44 | 9·56 | |
| 8 | Madras | Gold | ... | 3 | 162 | 30 | 120 | ... | 192 | 120 | 312 | *Nil* | 25 | 9·61 | |
| 9 | Hyderabad (Deccan) | „ | ... | 2 | 320 | 369 | 220 | ... | 689 | 220 | 909 | *Nil* | 9·09 | 2·20 | |
| 10 | Travancore | Plumbago | ... | 1 | 25 | 82 | 13 | ... | 107 | 13 | 120 | *Nil* | 76·92 | 8·33 | |
| 11 | Bengal | Mica | ... | 1 | 199 | 270 | 325 | 85 | 469 | 410 | 879 | *Nil* | 2·44 | 1·13 | |
| | | | 10 | 75 | 6,550 | 3,857 | 14,106 | 3,336 | 10,407 | 17,442 | 27,849 | 0·96 | 4·30 | 3·05 | |

*DEATHS caused by accidents at Mines in India during the year 1894.*

| No. | Districts. | Description of mine. | DEATHS. | | | | Totals. | Gross Totals. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Above ground. | | Below ground. | | | | |
| | | | Males. | Females. | Males. | Females. | | | |
| | BENGAL. *Burdwan Division.* | | | | | | | | |
| 1 | Burdwan District . . | Coal . | 1 | 1 | 11 | 3 | 16 | ... | Sub-division not known. |
| | Burdwan District. | | | | | | | | |
| 2 | Raniganj Sub-division . | „ . | ... | ... | 15 | 3 | 18 | | |
| | *Chota Nagpur Division.* | | | | | | | | |
| 3 | Hazaribagh District . | „ . | ... | 1 | 5 | ... | 6 | ... | Ditto. |
| | Hazaribagh District. | | | | | | | | |
| 4 | Giridih Sub-division . | „ . | 1 | ... | 4 | ... | 5 | | |
| 5 | Manbhum District . | „ . | ... | ... | 2 | 1 | 3 | ... | Ditto. |
| | CENTRAL PROVINCES. *Chanda District.* | | | | | | | | |
| 6 | Warora . . . | „ . | ... | ... | 3 | ... | 3 | | |
| | *Rewah State.* | | | | | | | | |
| 7 | Umaria . . . | „ . | ... | ... | 2 | 1 | 3 | | |
| | PUNJAB. *Rawal Pindi Division:* | | | | | | | | |
| 8 | Jhelum District . . | „ . | ... | ... | 1 | ... | 1 | | |
| | BELUCHISTAN. | | | | | | | | |
| 9 | Beluchistan District . | „ . | ... | ... | 3 | ... | 3 | | |
| | HYDERABAD (DECCAN). | | | | | | | | |
| 10 | Yellandu, Singareni . | „ . | 3 | ... | 6 | ... | 9 | | |
| | UPPER BURMA. | | | | | | | | |
| 11 | Shwebo District . . | „ . | ... | 1 | ... | ... | 1 | | |
| | ASSAM. *Lakhimpur District.* | | | | | | | | |
| 12 | Ledo Valley and Tikak . | „ . | 2 | ... | 7 | 1 | 10 | | |
| | | | | | | | Coal . | 78 | |
| | HYDERABAD (DECCAN). | | | | | | | | |
| 13 | Raichur District . . | Gold . | ... | ... | 2 | ... | 2 | | |
| | MADRAS. | | | | | | | | |
| 14 | North Arcot . . | „ . | ... | ... | 3 | ... | 3 | | |
| | | | | | | | Gold . | 5 | |
| | TRAVANCORE. | | | | | | | | |
| 15 | Vellanad . . . | Plumbago | ... | ... | 1 | ... | 1 | | |
| | | | | | | | Plumbago | 1 | |
| | BENGAL. *Chota Nagpur Division.* Hazaribagh District. | | | | | | | | |
| 16 | Giridih Sub-division . | Mica . | ... | ... | 1 | ... | 1 | | |
| | | | | | | | Mica . | 1 | |
| | | | 7 | 3 | 66 | 9 | ... | 85 | |
| | | | 10 | | 75 | | | | |

# Accidents.

## *Serious.*

| No. | Districts or Provinces. | Description of mine. | TOTAL ACCIDENTS. | | PERSONS EMPLOYED. | | | | | | | NUMBER OF SERIOUS (NON-FATAL) ACCIDENTS FOR EVERY 1,000 PERSONS EMPLOYED. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Above ground. | | Below ground. | | Totals employed. | | | | | | |
| | | | Above ground. | Below ground. | Males. | Females. | Males. | Females. | Above ground. | Below ground. | Above ground and below ground. | Number of non-fatal accidents above ground for every 1,000 persons employed above ground. | Number of non-fatal accidents below ground for every 1,000 persons employed below ground. | Number of non-fatal accidents above and below ground for every 1,000 persons employed at the mines. | |
| 1 | Bengal | Coal | ... | 10 | 4,026 | 2,813 | 6,869 | 2,187 | 6,839 | 9,056 | 15,895 | *Nil* | 1·10 | 0·62 | |
| 2 | Central Provinces | „ | 2 | 10 | 481 | 79 | 2,059 | 169 | 560 | 2,228 | 2,788 | 3·57 | 4·48 | 4·30 | |
| 3 | Punjab | „ | 2 | 8 | 71 | 1 | 50 | 1 | 72 | 51 | 123 | 27·77 | 156·90 | 81·30 | |
| 4 | Beluchistan | „ | ... | 8 | 325 | ... | 859 | ... | 325 | 859 | 1,184 | *Nil* | 9·31 | 6·75 | |
| 5 | Hyderabad (Deccan) | „ | 1 | 8 | 627 | 45 | 3,061 | 626 | 672 | 3,687 | 4,359 | 1·48 | 2·16 | 2·06 | |
| 6 | Burma (Upper) | „ | 3 | 2 | 91 | 45 | 59 | 40 | 136 | 99 | 235 | 22·05 | 20·20 | 21·27 | |
| 7 | Assam | „ | ... | 1 | 223 | 123 | 471 | 228 | 346 | 699 | 1,045 | *Nil* | 1·43 | 0·95 | |
| 8 | Travancore | Plumbago | ... | 2 | 25 | 82 | 13 | ... | 107 | 13 | 120 | *Nil* | 153·84 | 16·66 | |
| | | | 8 | 49 | 5,869 | 3,188 | 13,441 | 3,251 | 9,057 | 16,692 | 25,749 | 0·88 | 2·93 | 2·21 | |

*Serious accidents (non-fatal) at Mines in India during the year 1894.*

| No. | Districts. | Description of Mine. | Seriously injured. | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Above ground. | | Below ground. | | Totals. | Gross Totals. | |
| | | | Males. | Females. | Males. | Females. | | | |
| | Bengal. | | | | | | | | |
| | *Burdwan Division.* | | | | | | | | |
| 1 | Burdwan District | Coal | ... | ... | 1 | ... | 1 | | Sub-division not known. |
| | Burdwan District. | | | | | | | | |
| 2 | Raniganj Sub-division | „ | ... | ... | 4 | ... | 4 | | |
| | *Chota Nagpur Division.* | | | | | | | | |
| 3 | Hazaribagh District | „ | ... | ... | 1 | ... | 1 | | Sub-division not known. |
| | Hazaribagh District. | | | | | | | | |
| 4 | Giridih Sub-division | „ | ... | ... | 1 | ... | 1 | | |
| 5 | Manbhum District | „ | ... | ... | 2 | 1 | 3 | | Sub-division not known. |
| | Central Provinces. | | | | | | | | |
| | *Chanda District.* | | | | | | | | |
| 6 | Warora | „ | ... | ... | 1 | ... | 1 | | |
| | *Narsinghpur District.* | | | | | | | | |
| 7 | Mohpani | „ | 1 | ... | 5 | 1 | 7 | | |
| | *Rewah State.* | | | | | | | | |
| 8 | Umaria | „ | 1 | ... | 3 | ... | 4 | | |
| | Punjab. | | | | | | | | |
| | *Rawal Pindi Division.* | | | | | | | | |
| 9 | Jhelum District | „ | 2 | ... | 8 | ... | 10 | | |
| | Beluchistan. | | | | | | | | |
| 10 | Beluchistan District | „ | ... | ... | 8 | ... | 8 | | |
| | Hyderabad (Deccan). | | | | | | | | |
| 11 | Yellandu, Singareni | „ | 1 | ... | 7 | 1 | 9 | | |
| | Upper Burma. | | | | | | | | |
| 12 | Shwebo District | „ | 3 | ... | 2 | ... | 5 | | |
| | Assam. | | | | | | | | |
| | *Lakhimpur District.* | | | | | | | | |
| 13 | Ledo Valley and Tikak | „ | ... | ... | 1 | ... | 1 | | |
| | | | | | | | Coal | 55 | |
| | Travancore. | | | | | | | | |
| 14 | Vellanad | Plumbago | ... | ... | 2 | ... | 2 | | |
| | | | | | | | Plumbago | 2 | |
| | | | 8 | ... | 46 | 3 | ... | 57 | |
| | | | 8 | | 49 | | | | |

# *Particulars of* FATAL ACCIDENTS *during the year 1894.*

Number of accidents.
Number of deaths.
In night or day.

Occupations.
Ages.

| No. | State, Province, Division or District. | Description of mine or name of mineral wrought. | Number of accidents: Above ground: Between 6 A.M. and 6 P.M. | Number of accidents: Above ground: Between 6 P.M. and 6 A.M. | Number of accidents: Below ground: Between 6 A.M. and 6 P.M. | Number of accidents: Below ground: Between 6 P.M. and 6 A.M. | Number of deaths caused by accidents: Above ground: Males. | Number of deaths caused by accidents: Above ground: Females. | Number of deaths caused by accidents: Below ground: Males. | Number of deaths caused by accidents: Below ground: Females. | Occupations: Above ground: No. | Occupations: Above ground: Occupations. | Occupations: Below ground: No. | Occupations: Below ground: Occupations. | Ages: Above ground: Number above 12 years of age. | Ages: Above ground: Number below 12 years of age. | Ages: Below ground: Number above 12 years of age. | Ages: Below ground: Number below 12 years of age. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BENGAL. | | | | | | | | | | | | | | | | | | |
| | *Burdwan Division.* | | ... | ... | 4 | ... | ... | .. | 4 | ... | ... | ... | 4 | Miners | ... | ... | 4 | ... | |
| | | | ... | ... | ... | 5 | ... | ... | 5 | ... | ... | ... | 5 | Do. | ... | ... | 5 | ... | |
| | | | ... | ... | .. | 2 | ... | ... | 2 | ... | ... | ... | 2 | Khalasies | ... | ... | 2 | ... | |
| 1 | Burdwan District | Coal. | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Wading Cooly | ... | ... | 1 | ... | ... | ... | |
| | | | ... | ... | 3 | ... | ... | ... | ... | 3 | ... | ... | 2 | Mining | ... | ... | 3 | ... | |
| | | | | | | | | | | | | | 1 | ... | | | | | |
| | | | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Working on machinery | ... | ... | 1 | ... | ... | ... | |
| | Burdwan District. | | ... | ... | 2 | ... | ... | ... | ... | 2 | ... | ... | 2 | Coal carriers | ... | ... | 2 | ... | |
| | | | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Do. | ... | ... | 1 | ... | |
| | | | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 1 | Brakesman | ... | ... | 3 | ... | |
| | | | | | | | | | | | | | 2 | miners | | | | | |
| 2 | Raniganj Sub-division | ,, | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 2 | Hewers | ... | ... | 2 | ... | |
| | | | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 3 | Do. | ... | ... | 3 | ... | |
| | | | ... | ... | 6 | ... | ... | ... | 6 | ... | ... | ... | 1 | Assistant | ... | ... | 6 | ... | |
| | | | | | | | | | | | | | 5 | Coolies | | | | | |
| | | | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Cooly | ... | ... | 1 | ... | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | |
| | | | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Hewers | ... | ... | 2 | ... | |
| 3 | Hazaribagh District | | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Labourer | ... | ... | ... | 1 | ... | ... | |
| | | ,, | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Labourers | ... | ... | 2 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Loading Cooly | ... | ... | 1 | ... | |
| | Hazaribagh District. | | | | | | | | | | | | | | | | | | |
| | | | ... | ... | 4 | ... | ... | ... | 4 | ... | ... | ... | 4 | Miners | ... | ... | 4 | ... | |
| 4 | Giridih Sub-division | ,, | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Locomotive Driver | ... | ... | 1 | ... | ... | ... | |

*Particulars of* FATAL ACCIDENTS *during the year 1894*—continued.

| No. | State, Province, Division or District. | Description of mine or name of mineral wrought. | Number of Accidents. Above Ground. Between 6 A.M. and 6 P.M. | Number of Accidents. Above Ground. Between 6 P.M. and 6 A.M. | Number of Accidents. Below Ground. Between 6 A.M. and 6 P.M. | Number of Accidents. Below Ground. Between 6 P.M. and 6 A.M. | Number of Deaths caused by Accidents. Above Ground. Males. | Number of Deaths caused by Accidents. Above Ground. Females. | Number of Deaths caused by Accidents. Below Ground. Males. | Number of Deaths caused by Accidents. Below Ground. Females. | Occupations. Above ground. No. | Occupations. Above ground. Occupations. | Occupations. Below ground. No. | Occupations. Below ground. Occupations. | Ages. Above ground. Number above 12 years of age. | Ages. Above ground. Number below 12 years of age. | Ages. Below ground. Number above 12 years of age. | Ages. Below ground. Number below 12 years of age. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | |
| 5 | Manbhum District | Coal | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Labourer | ... | ... | 1 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Ditto | ... | ... | 1 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Hewer | ... | ... | 1 | ... | |
| | Central Provinces. | | | | | | | | | | | | | | | | | | |
| | Chanda District— | | | | | | | | | | | | | | | | | | |
| 6 | Warora | ,, | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Trammer | ... | ... | 1 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Hewer | ... | ... | 1 | ... | |
| | | | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Do. | ... | ... | 1 | ... | |
| | Rewah State— | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Do. | ... | ... | 1 | ... | |
| 7 | Umaria | ,, | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Trammer | ... | ... | 1 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Daily | ... | ... | 1 | ... | |
| | Punjab. | | | | | | | | | | | | | | | | | | |
| | *Rawal Pindi Division.* | | | | | | | | | | | | | | | | | | |
| 8 | Jhelum District | ,, | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Petty Contractor | ... | ... | 1 | ... | |
| | Beluchistan. | | | | | | | | | | | | | | | | | | |
| 9 | Beluchistan District | ,, | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 1 | Carpenter | ... | ... | 3 | ... | |
| | | | | | | | | | | | | | 2 | Hewers | | | | | |
| | Hyderabad (Deccan). | | ... | 3 | ... | ... | 3 | ... | ... | ... | 3 | Shunting coolies | ... | ... | 3 | ... | ... | ... | |
| | | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Cooly | ... | ... | 1 | ... | |
| | | | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Hewers | ... | ... | 2 | ... | |
| 10 | Yellandu, Singareni | ,, | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 1 | Filler | ... | ... | 2 | ... | |
| | | | | | | | | | | | | | 1 | Ropeman | | | | | |
| | | | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Platelaying Makadam | ... | ... | 1 | ... | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BURMA (UPPER). | | | | | | | | | | | | | | | | | |
| 11 | Shwebo District | „ | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Not employed at mine. | ... | ... | | 1 | ... | ... | ... |
| | ASSAM. | | | | | | | | | | | | | | | | | |
| | | | ... | ... | 4 | ... | ... | ... | 4 | ... | ... | ... | 4 | ... | | ... | .. | Not stated | ... |
| 12 | Ledo Valley and Tikak | „ | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | | ... | ... | ... | ... |
| | | | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 3 | ... | | ... | ... | 3 | ... |
| | | | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | | 2 | ... | ... | ... |
| | | COAL TOTALS | 7 | 3 | 54 | 14 | 7 | 3 | 59 | 9 | 10 | ... | 68 | ... | | 9 | 1 | 68 | ... |
| | MADRAS. | | | | | | | | | | | | | | | | | |
| 1 | North Arcot | Gold | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 3 | Miners | | ... | ... | 3 | ... |
| | HYDERABAD (DECCAN). | | | | | | | | | | | | | | | | | |
| 2 | Raichur District | „ | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Drillers | | ... | ... | 2 | ... |
| | | GOLD TOTALS | ... | ... | 5 | ... | ... | ... | 5 | ... | ... | ... | 5 | ... | | ... | ... | 5 | ... |
| | TRAVANCORE. | | | | | | | | | | | | | | | | | |
| 1 | Vellanad | Plumbago | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Cooly | | ... | ... | 1 | ... |
| | | PLUMBAGO TOTALS | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | ... | | ... | ... | 1 | ... |
| | BENGAL. | | | | | | | | | | | | | | | | | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | |
| | Hazaribagh District. | | | | | | | | | | | | | | | | | |
| 1 | Giridih Sub-division | Mica | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Cooly | | ... | ... | 1 | ... |
| | | MICA TOTALS | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | | ... | ... | 1 | ... |
| | | GROSS TOTALS | 7 | 3 | 60 | 15 | 7 | 3 | 66 | 9 | 10 | ... | 75 | ... | | 9 | 1 | 75 | ... |

# *Particulars of* SERIOUS ACCIDENTS *during the year 1894.*

Number of accidents.
Number injured.
In night or day.

Occupations.
Ages.

| | State, Province, Division, or District. | Description of mine or name of mineral wrought. | Number of Accidents. Above ground. Between 6 A.M. and 6 P.M. | Number of Accidents. Above ground. Between 6 P.M. and 6 A.M. | Number of Accidents. Below ground. Between 6 A.M. and 6 P.M. | Number of Accidents. Below ground. Between 6 P.M. and 6 A.M. | Number of Persons injured by Accidents. Above ground. Males. | Number of Persons injured by Accidents. Above ground. Females. | Number of Persons injured by Accidents. Below ground. Males. | Number of Persons injured by Accidents. Below ground. Females. | Occupations. Above ground. No. | Occupations. Above ground. Occupations. | Occupations. Below ground. No. | Occupations. Below ground. Occupations. | Ages. Above ground. Number above 12 years of age. | Ages. Above ground. Number below 12 years of age. | Ages. Below ground. Number above 12 years of age. | Ages. Below ground. Number below 12 years of age. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BENGAL. | | | | | | | | | | | | | | | | | | |
| | *Burdwan Division.* | | | | | | | | | | | | | | | | | | |
| 1 | Burdwan District | Coal | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Miner | ... | ... | 1 | ... | |
| | Burdwan District. | | | | | | | | | | | | | | | | | | |
| 2 | Raniganj Sub-division | „ | ... | ... | 3 | ... | ... | ... | 3 | ... | .. | ... | 3 | Do. | ... | ... | 3 | ... | |
| | | | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Do. | ... | ... | 1 | ... | |
| | *Chôta Nagpur Division.* | | | | | | | | | | | | | | | | | | |
| 3 | Hazaribagh District | „ | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Hewer | ... | ... | 1 | ... | |
| | Hazaribagh District. | | | | | | | | | | | | | | | | | | |
| 4 | Giridih Sub-division. | „ | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Sardar | ... | ... | 1 | ... | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | |
| 5 | Manbhum District | „ | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Hewers | ... | ... | 2 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Dust woman | ... | ... | 1 | ... | |
| | CENTRAL PROVINCES. | | | | | | | | | | | | | | | | | | |
| 6 | Chanda District (Warora) | „ | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Oil boy | ... | ... | 1 | ... | |
| | | | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Filler boy | ... | ... | 1 | ... | ... | ... | |
| 7 | Narsingpur District (Mohpani). | „ | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Mates | ... | ... | 2 | ... | |
| | | | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 3 | Hewers | ... | ... | 3 | ... | |
| | | | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | 1 | Carrier | ... | ... | 1 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Trammer | ... | ... | 1 | ... | |
| 8 | Rewah States (Umaria) | „ | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 2 | Do. | ... | ... | 2 | ... | |
| | | | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Daily | ... | ... | 1 | ... | ... | ... | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PUNJAB. | | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | Coolies . . | ... | ... | 2 | ... | The times of day or night of these accidents were not given. |
| | *Rawal Pindi Division.* | | 1 | | ... | ... | 1 | ... | ... | ... | 1 | Cooly . . | ... | ... | 1 | ... | ... | ... | |
| 9 | Jhelum District . . | „ . . | 1 | | ... | ... | 1 | ... | ... | ... | 1 | Khalasi . . | ... | ... | 1 | ... | ... | ... | |
| | | | ... | ... | 6 | ... | ... | ... | 6 | ... | ... | ... | 5 | Hewers . . | ... | ... | 6 | ... | |
| | | | | | | | | | | | | | 1 | Stone hewer . | | | | | |
| | BELUCHISTAN. | | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 1 | Hewer . . | ... | ... | 2 | ... | |
| | | | | | | | | | | | | | 1 | Cooly . . | | | | | |
| 10 | Beluchistan district . | „ . . | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 3 | Hewers . . | ... | ... | 3 | ... | |
| | | | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | ... | 3 | ... | |
| | | | | | | | | | | | | | 2 | Coolies . . | | | | | |
| | | | ... | ... | 2 | ... | . | ... | 2 | ... | ... | ... | 2 | Makadams . | ... | ... | 2 | ... | |
| | HYDERABAD (DECCAN.) | | ... | ... | 3 | ... | ... | ... | 3 | ... | ... | ... | 1 | Platelaying cooly | ... | ... | 3 | ... | |
| | | | | | | | | | | | | | 2 | Coolies . . | | | | | |
| 11 | Yellandu (Singareni) . | „ . . | 1 | ... | ... | ... | 1 | .. | ... | ... | 1 | Shunting cooly . | ... | ... | 1 | ... | ... | ... | |
| | | | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Hewer . . | ... | ... | 1 | ... | |
| | | | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | 1 | Do. . . | ... | ... | 1 | ... | |
| | | | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | 1 | Filler . . | ... | ... | 1 | ... | |
| | BURMA (UPPER.) | | ... | 2 | ... | ... | 2 | ... | ... | ... | 1 | Engine driver . | .. | ... | 2 | ... | ... | ... | |
| | | | | | | | | | | | 1 | Fireman . . | | | | | | | |
| 12 | Shwebo District . . | „ . . | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 1 | Pump boy . | ... | ... | 2 | ... | |
| | | | | | | | | | | | | | 1 | Tub boy . | | | | | |
| | | | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Cooly . . | ... | ... | 1 | ... | ... | ... | |
| | ASSAM. | | | | | | | | | | | | | | | | | | |
| 13 | Ledo Valley and Tikak . | „ . . | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | Foreman . . | ... | ... | 1 | ... | |
| | | COAL TOTALS . | 4 | 2 | 31 | 8 | 8 | ... | 44 | 3 | 8 | ... | 47 | ... | 8 | ... | 47 | ... | |
| | TRAVANCORE. | | | | | | | | | | | | | | | | | | |
| 1 | Vellanad . . . | Plumbago . | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 2 | Coolies . . | ... | ... | 2 | ... | |
| | | PLUMBAGO TOTALS . | ... | ... | ... | 2 | ... | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 2 | ... | |
| | | GROSS TOTALS . | 4 | 2 | 31 | 10 | 8 | ... | 46 | 3 | 8 | ... | 49 | ... | 8 | ... | 49 | ... | |
| | | | 2 others the times of which were not given. | | 8 others the times of which were *not* given. | | | | | | | | | | | | | | |

It may be noticed from the foregoing statements that of the total 75 deaths below ground 15 or 20 per cent. happened in the night time between 6 P.M. and 6 A.M.

And of the ten deaths above ground 3 or 30 per cent. happened in the night time.

Also of the 49 other accidents below ground, classed as serious, 10 or 20·4 per cent. happened in the night time. The time for eight of the accidents was not stated.

Of the eight serious accidents above ground 2 or 25 per cent. happened in the night time. The time for two of the accidents was not stated. The ages of all the persons killed below ground were given as being over 12 years of age.

There was one, a female, below 12 years of age killed above ground. All the ages given for those seriously injured were above 12 years.

The following statement shows some of the employments of the persons killed and injured :—

*Occupations of persons killed and injured.*

| Occupations. | Above ground. | | Below ground. | |
|---|---|---|---|---|
| | Number killed. | Number seriously injured. | Number killed. | Number seriously injured. |
| 1. Miners and Hewers | ..... | ..... | 36 | 24 |
| 2. Khalasies | ..... | 1 | 2 | ..... |
| 3. Coal Carriers | ..... | ..... | 3 | 1 |
| 4. Coolies | 6 | 4 | 15 | 10 |
| 5. Trammers | ..... | ..... | 2 | 4 |
| 6. Petty Contractor | ..... | ..... | 1 | ..... |
| 7. Carpenter | ..... | ..... | 1 | ..... |
| 8. Fillers | ..... | 1 | 1 | 1 |
| 9. Ropeman | ..... | ..... | 1 | ..... |
| 10. Platelaying Makadam | ..... | ..... | 1 | ..... |
| 11. Drillers | ..... | ..... | 2 | ..... |
| 12. Not employed at the mine | 1 | ..... | ..... | ..... |
| 13. Locomotive driver | 1 | 1 | ..... | ..... |
| 14. Sardar | ..... | ..... | ..... | 1 |
| 15. Dust woman | ..... | ..... | ..... | 1 |
| 16. Oil boy | ..... | ..... | ..... | 1 |
| 17. Mates | ..... | ..... | ..... | 2 |
| 18. Makadams | ..... | ..... | ..... | 2 |
| 19. Pump boy | ..... | ..... | ..... | 1 |
| 20. Foreman | ..... | ..... | ..... | 1 |
| 21. Engine Fireman | ..... | 1 | ..... | ..... |

# RAILWAY COLLIERIES, AND OTHERS.

Number of persons employed daily.
Tons of coal raised per person employed.
Number of fatal accidents.
Number of persons killed.
Number of other accidents.
Number of persons injured.
Persons employed per accident and per death.
Tons of coal raised.
Total output.

## *I.—East Indian Railway Company's Kurhurbaree and Serampore Collieries, Giridih.*

| Year. | Average number of persons employed daily. | Number of tons raised per person employed. | Total number of fatal accidents. | Number of persons killed. | Total number of other accidents. | Number of persons injured. | Average number of persons employed daily: Per fatal accident. | Average number of persons employed daily: Per death. | Number of tons of coal raised of all kinds: Per fatal accident. | Number of tons of coal raised of all kinds: Per death. | Total Output. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Tons. | | | | | | | Tons. | Tons. | Tons. | |
| 1893 | 4,922 | 78 | 2 | 5 | 4? | 2? | 2,461 | 984 | 191,794 | 76,717 | 383,587 | Twenty-five shafts and inclines. |
| 1894 | 5,307 | 74 | 6 | 6 | 29? | 11? | 885 | 885 | 65,202 | 65,202 | 391,214 | Working out pillars. Use ponies below ground. *Note.*—The figures with ? attached are curious and puzzling. |
| | | | | | | | | | | | | ***II.—Warora Colliery.*** |
| 1893 | 1,133 | 108 | 2 | 5 | 45? | 7? | 566 | 227 | 60,973 | 24,389 | 121,946 | Six shafts in use. |
| 1894 | 1,146 | 106 | 3 | 3 | 48? | 10? | 382 | 382 | 40,382 | 40,382 | 121,185 | No females employed below ground. Are working out pillars. Average selling price of coal for the year R4-11-6 per ton. A Stanley coal-cutting machine in use, worked by natives and compressed air, average speed of driving is 2′ 5″ per shift of 8 hours. Good fire-bricks, roofing and flooring tiles, and other very excellent refractory things of many useful patterns and sizes are made at this Colliery. |
| | | | | | | | | | | | | ***III.—Mohpani Colliery.*** |
| 1893 | 460 | 29 | ... | ... | 18? | 1? | ... | ... | ... | ... | 13,172 | Nine shafts, staples, and drifts. |
| 1894 | 622 | 31 | ... | ... | 17? | 6? | ... | ... | ... | ... | 19,349 | Working back from the various boundaries of the old mine; and opening up the new mine. Prospects of the new coal field are, apparently, promising. |
| | | | | | | | | | | | | ***IV.—Umaria Colliery.*** |
| *1893* | *816* | *116* | ... | ... | *16* | *16* | ... | ... | ... | ... | 94,348 | Have 5 pits and 3 inclines in use. Are working out pillars. |
| *1894* | *972* | *137* | *1* | *1* | *16* | *17* | *972* | *972* | *132,837* | *132,837* | *132,837* | The selling prices of large coal were R4-0-0 and R4-3-0 per ton. And of slack R1-6-0 and R1-12-0 per ton. |
| | | | | | | | | | | | | ***V.—Singareni Colliery.*** |
| 1893 | 2,136 | 74 | ... | ... | ... | ... | ... | ... | ... | ... | 157,421 | Have 3 winding shafts and 1 hauling incline; and 510 working faces for hewers. |
| 1894 | 3,283 | 73 | 8 | ... | 10 | ... | ... | ... | ... | ... | 240,524 | Several "faults" have been crossed. A large proportion of the output is disposed of unscreened, and called "Singareni" coal. The mining population and the development of the colliery are rapidly increasing. |
| | | | | | | | | | | | | ***VI.—Dandot Colliery.*** |
| 1893 | 2,563 | 29 | 7 | 7 | 27 | 27 | 366 | 366 | 10,641 | 10,641 | 74,484 | |
| 1894 | 1,873 | 33 | 1 | 1 | 18 | 18 | 1,873 | 1,873 | 61,976 | 61,976 | 61,976 | |
| | | | | | | | | | | | | ***VII.—Bhaganwala Colliery.*** |
| 1893 | 100 | 28 | ... | ... | 1 | 1 | ... | ... | ... | ... | 2,809 | |
| 1894 | 798 | 6 | ... | ... | 1 | 1 | ... | ... | ... | ... | 4,492 | |
| | | | | | | | | | | | | ***VIII.—Khost Colliery.*** |
| 1893 | 380 | 48 | 3 | 4 | 4 | 4 | 127 | 95 | 6,032 | 4,524 | 18,096 | |
| 1894 | 400 | 43 | 3 | 4 | 8? | 7? | 133 | 100 | 5,720 | 4,290 | 17,159 | |
| | | | | | | | | | | | | ***IX.—Sharigh Colliery.*** |
| 1893 | 150 | 10 | 2 | 2 | ... | ... | 75 | 75 | 759 | 759 | 1,518 | Only worked for six months in 1893. |
| 1894 | 200 | 22 | ... | ... | ... | ... | ... | ... | ... | ... | 4,339 | |

## 22.—MINING LEGISLATION, PERSONS EMPLOYED, AND ACCIDENTS AT MINES IN THE UNITED KINGDOM.

### Good results from mining legislation and inspection in the United Kingdom—

Comparisons are sometimes allowable and useful, and may help to create a desire to rise up to the standard used for comparison. Facts and figures are also at times valuable; and if correct and properly used, may serve very useful purposes and become a standing source of information and reference. It is in this spirit that I give the following tables of statements having reference solely to the mines in the United Kingdom of Great Britain and Ireland They give facts as to mines, persons employed, and accidents; and show the progress that has been made since mining legislation and inspection was first introduced, and the safety of mining now, as compared to its condition in the year 1850, when proper mining inspection was first introduced by the appointment of the first three inspectors to make inspections below ground. I may say that it has been my privilege and to my advantage to have acted as Inspector of Mines for 4 years as the assistant to one of these first Inspectors of Mines who was appointed to that position in the year 1850, and only recently retired. I do not wish to be understood as claiming the progress for inspectors and inspection, but undoubtely much is due to inspection; yet having said so much, I should appear to fail in the appreciation of the good work of all others connected with mining if I did not express what is my firm conviction that mining officials, and others who were not in such an official capacity, have one and all done almost as much as appeared to them to lie in their power to reduce the number of accidents from all causes to a minimum; and that the greater part of the success has been due to their efforts. The Mines Acts have been like finger posts pointing out the way, and the Inspectors have come in to direct those who could not or would not read, and even to force those into the right path who would persistently go wrong in spite of all directions and warnings. Let us hope, and all try, to make mining legislation and inspection in India even more beneficial than it has been in the United Kingdom; and the success of Indian mining so much greater as to be beyond comparison.

### Notes on the figures relating to Mines in the United Kingdom—

The statements are compiled from figures furnished to the English Home Office by the Inspectors of Mines.

The principal statutes which regulate mining in the United Kingdom are the Coal Mines Regulation Act, 1887, and the Metalliferous Mines Regulation Act, 1872, and the information has been arranged so as to distinguish between the two classes of mines.

### Persons employed, United Kingdom.—Year 1894—

The total number of persons employed during this year, in and about all the mines of the United Kingdom, was 739,097.

| | Under Coal Mines Act. | | Under Metalliferous Mines Act. | |
|---|---|---|---|---|
| | Year 1894. | Year 1893. | Year 1894. | Year 1893. |
| Number of mines | 3,419 | ... | 740 | ... |
| Total persons employed | 705,240 | 683,008 | 33,857 | 35,739 |
| In 1894, the number of persons employed *below ground* was 80 per cent. of the whole number, or | 569,678 | 540,738 | 20,011 (about 60 per cent.) | 21,240 |
| Number employed on surface | 135,562 | 133,270 | 13,846 | 14,499 |
| In 1894, about 3 per cent. of surface workers were females—number of females | 4,583 | 4,725 | 1,092 (about 8 per cent. of surface workers) | 1,035 |

## Output of Minerals, United Kingdom—

Total output under the Coal Mines Act was 199,451,018.

| | |
|---|---|
| Coal | 188,277,525 |
| Fireclay | 2,164,863 |
| Ironstone | 6,814,546 |
| Oil shale | 1,986,385 |
| Sundry minerals | 207,699 |
| | 199,451,018 |

The amount of coal raised in 1894 exceeded by 2,798,399 tons, the highest output hitherto recorded, *viz.*, that of 1891.

## Total Accidents, United Kingdom, year 1894.

At the mines under the Coal Mines Act, there were 813 separate fatal accidents causing 1,127 deaths. Compared with 1893 there was an increase of four in the number of accidents and 67 in the number of deaths.

At the mines under the Metalliferous Mines Act there were 39 fatal accidents which caused 46 deaths. The number of separate fatal accidents is the same as it was in 1893, but there is a decrease of 19 in the number of deaths.

## Death-rates from Accidents United Kingdom, year 1894—

The death-rate of the underground workers at the mines under the Coal Mines Act was 1·782 per 1,000 persons employed below ground; and that of the surface workers 0·826 per 1,000 employed above ground; the corresponding figures for 1893 were 1·709 and 0·900 respectively.

At the mines under the Metalliferous Mines Act, the death-rate of the underground workers, 1·999 per 1,000 persons employed below ground was higher than at the mines under the Coal Mines Act; the risk of the surface workers, represented by 0·433 per 1,000, was very decidedly lower than that of the surface workers at the mines under the Coal Mines Act.

*Mines in the United Kingdom of Great Britain and Ireland, under the Coal Mines Regulation Acts.*

| | | Year 1893. | Year 1894. |
|---|---|---|---|
| | PERSONS EMPLOYED. | | |
| 1 | Number of persons employed below ground . . | 549,738 | 569,678 |
| 2 | „ „ „ „ above ground . . | 133,270 | 135,562 |
| 3 | Total number of persons employed . . . . | 683,008 | 705,240 |
| | DEATHS BELOW GROUND. *And rates for every 1,000 persons employed below ground.* | | |
| 4 | From explosions of firedamp . . Total . | 160 | 317 |
| 5 | „ „ „ „ for every 1,000 persons employed. | 0·287 | 0·556 |
| 6 | From falls in the mine . . . . Total . | 412 | 444 |
| 7 | „ „ „ „ „ for every 1,000 persons employed | 0·749 | 0·779 |
| 8 | In shafts . . . . . Total . | 103 | 77 |
| 9 | „ „ for every 1,000 persons employed . | 0·187 | 0·135 |
| 10 | From miscellaneous causes below ground Total . | 265 | 177 |
| 11 | „ „ „ „ „ for every 1,000 persons employed. | 0·486 | 0·311 |
| 12 | Total deaths below ground . . . . . | 940 | 1,015 |
| 13 | „ „ „ „ for every 1,000 persons employed. | 1·709 | 1·782 |
| | DEATHS ABOVE GROUND. | | |
| 14 | Total deaths above ground . . . . . | 120 | 112 |
| 15 | „ „ „ „ for every 1,000 persons employed above ground. | 0·900 | 0·826 |
| | DEATHS ABOVE AND BELOW GROUND. | | |
| 16 | Gross total deaths . . . . . | 1,060 | 1,127 |
| 17 | „ „ „ for every 1,000 persons employed . | 1·552 | 1·598 |
| 18 | Gross output in statute tons . . . . . | 175,236,857 | 199,451,018 |
| 19 | Tons of mineral wrought per life lost above and below ground. | 168,148 | 176,975 |
| 20 | „ „ „ „ „ person employed . | 257 | 283 |
| 21 | Total number of Mines . . . . . | 3,383 | 3,419 |

# ALL THE MINES IN THE UNITED KINGDOM.

## COAL AND METALLIFEROUS MINES REGULATION ACTS.

### Total number of persons employed.

(No. 1 SUMMARY.—Persons employed in and about all mines in the United Kingdom of Great Britain and Ireland, with the Isle of Man, and inclusive of those employed on private Branch Railways and Tramways and in washing and coking coal on premises adjacent to or belonging to the mine.)

| YEAR. | PERSONS EMPLOYED. | | | | | TOTAL. |
|---|---|---|---|---|---|---|
| | Underground. | Above ground, including sidings at the pit. | | Above ground on Branch Railways, etc. | | |
| | Males. | Males. | Females. | Males. | Females. | |
| 1888 | 465,006 | 108,054 | 5,357 | 13,916 | 323 | 592,656 |
| 1889 | 489,179 | 112,513 | 5,463 | 17,760 | 314 | 625,229 |
| 1890 | 531,670 | 118,018 | 5,599 | 18,856 | 291 | 674,434 |
| 1891 | 559,189 | 122,870 | 5,819 | 9,240 | 293 | 707,411 |
| 1892 | 571,840 | 124,852 | 5,774 | 19,017 | 325 | 721,808 |
| 1893 | 570,971 | 142,009 | 5,760 | These are included in last two columns. | | 718,740 |
| 1894 | 589,689 | 143,733 | 5,675 | | | 739,097 |

# ALL THE MINES IN THE UNITED KINGDOM.

## COAL AND METALLIFEROUS MINES REGULATION ACTS.

Persons employed.
Number of accidents.
Number of deaths.
Number of persons employed compared with accidents and deaths.

(No. 2 SUMMARY.—Persons employed, exclusive of those employed on private Branch Railways and Tramways, and in washing and coking coal in and about all mines in the United Kingdom of Great Britain and Ireland, with the Isle of Man, number of fatal accidents and deaths, and ratios of the number of persons employed to the number of fatal accidents and deaths.)

| YEAR. | PERSONS EMPLOYED. | | | | Separate fatal accidents. | Deaths caused by the accidents. | PERSONS EMPLOYED. | | Death rate from accidents per 1,000 persons employed. |
|---|---|---|---|---|---|---|---|---|---|
| | UNDER GROUND. | ABOVE GROUND. | | TOTAL. | | | Per fatal accident. | Per life lost. | |
| | Males. | Males. | Females. | | | | | | |
| 1874 . . . | 462,647 | 121,508 | 11,035 | 595,190 | 989 | 1,159 | 601 | 513 | 1·947 |
| 1875 . . . | 461,922 | 121,689 | 10,307 | 593,918 | 1,037 | 1,363 | 572 | 435 | 2·295 |
| 1876 . . . | 443,338 | 119,063 | 9,628 | 572,029 | 905 | 1,003 | 632 | 570 | 1·753 |
| 1877 . . . | 429,120 | 113,952 | 8,714 | 551,786 | 951 | 1,305 | 580 | 422 | 2·365 |
| 1878 . . . | 413,603 | 105,410 | 7,774 | 526,787 | 885 | 1,490 | 595 | 353 | 2·828 |
| 1879 . . . | 413,444 | 103,391 | 7,035 | 523,870 | 843 | 1,037 | 621 | 505 | 1·979 |
| 1880 . . . | 423,426 | 107,512 | 6,903 | 537,841 | 897 | 1,402 | 599 | 383 | 2·606 |
| 1881 . . . | 432,678 | 110,780 | 6,961 | 550,419 | 929 | 1,053 | 592 | 522 | 1·913 |
| 1882 . . . | 440,006 | 112,433 | 7,054 | 559,493 | 959 | 1,218 | 583 | 459 | 2·176 |
| 1883 . . . | 447,188 | 111,531 | 6,449 | 565,168 | 989 | 1,140 | 571 | 495 | 2·017 |
| Averages for the 10 years 1874 to 1883 inclusive. | 436,737 | 112,727 | 8,186 | 557,650 | 938 | 1,217 | 594 | 458 | 2·182 |
| 1884 . . . | 448,847 | 109,403 | 6,246 | 564,496 | 917 | 998 | 615 | 565 | 1·768 |
| 1885 . . . | 449,093 | 106,607 | 5,976 | 561,676 | 866 | 1,214 | 648 | 462 | 2·164 |
| 1886 . . . | 448,657 | 106,867 | 5,568 | 561,092 | 869 | 1,018 | 645 | 551 | 1·814 |
| 1887 . . . | 453,653 | 108,648 | 5,725 | 568,026 | 881 | 1,051 | 644 | 540 | 1·850 |
| 1888 . . . | 465,006 | 108,054 | 5,357 | 578,417 | 885 | 960 | 653 | 603 | 1·660 |
| 1889 . . . | 489,179 | 112,513 | 5,463 | 607,155 | 912 | 1,128 | 666 | 538 | 1·858 |
| 1890 . . . | 531,670 | 118,018 | 5,599 | 655,287 | 899 | 1,206 | 729 | 543 | 1·840 |
| 1891 . . . | 559,189 | 122,870 | 5,819 | 687,878 | 961 | 1,030 | 716 | 668 | 1·497 |
| 1892 . . . | 571,840 | 124,852 | 5,774 | 702,466 | 862 | 1,034 | 815 | 679 | 1·466 |
| 1893 . . . | 570,971 | 142,009 | 5,760 | 718,740 | 848 | 1,125 | 847 | 639 | 1·565 |
| 1894 . . . | 589,689 | 143,733 | 5,675 | 739,097 | 852 | 1,173 | 867 | 630 | 1·587 |

# UNITED KINGDOM.

## COAL MINES REGULATION ACT.

Persons employed.
Quantity of mineral wrought.
Number of accidents.
Number of deaths.
Persons employed compared with accidents and deaths.

(No. 3 SUMMARY.—Persons employed, *exclusive* of those employed on private Branch Railways and Tramways, and in washing and coking coal. Quantity of Mineral wrought, Number of Fatal Accidents and Deaths, and Ratios of the Number of Persons employed to the number of Fatal Accidents and Deaths, at the Mines in the United Kingdom of Great Britain and Ireland under the Coal Mines Regulation Act.)

| YEAR. | PERSONS EMPLOYED. | | | | Quantity of Coal and other Minerals wrought. | Separate fatal accidents. | Lives lost by the accidents. | Persons employed. | | Death rate from accidents per 1,000 persons employed. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Under Ground. (A.) | ABOVE GROUND. (B.) | | Total of (A.) & (B.) | | | | Per fatal accident. | Per Life Lost. | |
| | Males. | Males. | Females. | | | | | | | |
| | | | | | Statute Tons. | | | | | |
| 1874 | 428,611 | 103,319 | 6,899 | 538,829 | 140,713,832 | 895 | 1,056 | 602 | 510 | 1·959 |
| 1875 | 427,017 | 102,324 | 6,504 | 535,845 | 147,700,313 | 927 | 1,244 | 578 | 430 | 2·321 |
| 1876 | 409,229 | 99,248 | 6,055 | 514,532 | 148,989,385 | 839 | 933 | 613 | 551 | 1·813 |
| 1877 | 395,025 | 93,988 | 5,378 | 494,391 | 148,846,260 | 864 | 1,208 | 572 | 409 | 2·443 |
| 1878 | 382,979 | 87,394 | 4,956 | 475,329 | 145,798,138 | 811 | 1,413 | 586 | 336 | 2·972 |
| 1879 | 385,179 | 86,789 | 4,842 | 476,810 | 145,366,369 | 782 | 973 | 610 | 490 | 2·040 |
| 1880 | 391,381 | 88,912 | 4,640 | 484,933 | 161,466,793 | 815 | 1,318 | 595 | 368 | 2·718 |
| 1881 | 399,387 | 91,375 | 4,715 | 495,477 | 168,959,931 | 844 | 954 | 587 | 519 | 1·925 |
| 1882 | 406,192 | 93,143 | 4,652 | 503,987 | 171,334,032 | 876 | 1,126 | 575 | 447 | 2·234 |
| 1883 | 416,696 | 93,758 | 4,479 | 514,933 | 178,763,390 | 921 | 1,054 | 559 | 488 | 2·046 |
| Averages for the 10 years 1874 to 1883 inclusive | 404,169 | 94,025 | 5,312 | 503,506 | 155,793,844 | 857 | 1,128 | 587 | 446 | 2·240 |
| 1884 | 422,233 | 93,685 | 4,458 | 520,376 | 174,872,759 | 863 | 942 | 603 | 552 | 1·810 |
| 1885 | 424,191 | 92,138 | 4,303 | 520,632 | 173,223,960 | 807 | 1,150 | 645 | 453 | 2·207 |
| 1886 | 423,862 | 91,977 | 4,131 | 519,970 | 170,006,959 | 807 | 953 | 644 | 545 | 1·833 |
| 1887 | 428,540 | 93,554 | 4,183 | 526,277 | 173,049,795 | 830 | 995 | 634 | 529 | 1·890 |
| 1888 | 438,902 | 92,108 | 3,935 | 534,945 | 182,660,163 | 821 | 888 | 652 | 602 | 1·660 |
| 1889 | 463,600 | 96,108 | 4,027 | 563,735 | 189,633,656 | 848 | 1,064 | 665 | 530 | 1·887 |
| 1890 | 506,812 | 102,215 | 4,206 | 613,233 | 194,605,887 | 861 | 1,160 | 712 | 528 | 1·891 |
| 1891 | 536,091 | 107,903 | 4,456 | 648,450 | 197,693,592 | 911 | 979 | 712 | 662 | 1·510 |
| 1892 | 549,312 | 110,442 | 4,546 | 664,390 | 191,954,998 | 814 | 982 | 816 | 676 | 1·478 |
| 1893 | 549,738 | All persons employed above ground. 128,545 | 4,725 | 683,008 | 175,236,857 | 809 | 1,060 | 844 | 644 | 1·552 |
| 1894 | 569,678 | 130,979 | 4,583 | 705,240 | 199,451,018 | 813 | 1,127 | 867 | 626 | 1·600 |

# UNITED KINGDOM.

## COAL MINES REGULATION ACT.—FATAL ACCIDENTS.

*Accidents* classified.
Persons employed.
Ratio of persons employed to each *accident* under each head.

(No. 7 SUMMARY.—Ratios of Fatal Accidents to the numbers of Persons employed in and about the Mines under the former and present Coal Mines Acts, exclusive of those on Private Branch Railways and Tramways, and in Washing and Coking Coal.)

| | Accidents causing one or more Deaths. | | | | | | Persons employed (A.) (B.) | Ratio of Persons employed to each Fatal Accident. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year. | Fire-damp Explosion. | Roof and Sides Falling. | Shaft. | Miscellaneous Underground. | On Surface | Total. | Above ground and below ground. | Fire-damp Explosion. | Roof and Sides Falling. | Shaft. | Miscellaneous Underground. | On Surface. | Total. |
| *Act for Inspection of Coal Mines in Great Britain, 1850, 13 & 14 Vict., Cap. 100.* | | | | | | | | | | | | | |
| Totals, 5 yrs. 1851—1855 | 464 | 1,752 | 1,024 | 441 | 223 | 3,904 | 1,147,341 | ... | ... | ... | ... | ... | ... |
| Averages . | 93 | 350 | 205 | 88 | 45 | 781 | 229,468 | 2,473 | 655 | 1,120 | 2,602 | 5,145 | 294 |
| *Act for Inspection of Coal Mines in Great Britain, 1855, 18 & 19 Vict., Cap. 108.* | | | | | | | | | | | | | |
| Totals, 5 yrs. 1856—1860 | 356 | 1,859 | 813 | 562 | 245 | 3 835 | 1,312,981 | ... | ... | ... | ... | ... | ... |
| Averages . | 71 | 372 | 163 | 112 | 49 | 767 | 262,596 | 3,688 | 706 | 1,615 | 2,336 | 5,359 | 342 |
| *Act for the Regulation and Inspection of Coal Mines and Ironstone Mines connected with Coal, 1860, 23 & 24 Vict., Cap. 151.* | | | | | | | | | | | | | |
| Totals, 12 yrs. 1861—1872 | 679 | 4,902 | 1,582 | 1,901 | 884 | 9,948 | 3,981,374 | ... | ... | ... | ... | ... | ... |
| Averages . | 57 | 408 | 132 | 158 | 74 | 829 | 331,781 | 5,864 | 812 | 2,517 | 2,094 | 4,504 | 400 |
| *Coal Mines Regulation Act, 1872, applying to Coal, Stratified Ironstone, Shale, and Fireclay Mines, 35 & 36 Vict., Cap. 76.* | | | | | | | | | | | | | |
| 1873 | 44 | 474 | 158 | 211 | 86 | 973 | 512,199 | 11,641 | 1,080 | 3,242 | 2,427 | 5,955 | 526 |
| 1874 | 44 | 403 | 145 | 200 | 103 | 895 | 538,829 | 12,246 | 1,337 | 3,716 | 2,694 | 5,231 | 602 |
| 1875 | 41 | 440 | 153 | 196 | 97 | 927 | 535,845 | 13,069 | 1,217 | 3,502 | 2,733 | 5,524 | 578 |
| 1876 | 42 | 430 | 120 | 146 | 101 | 839 | 514,532 | 12,250 | 1,196 | 4,287 | 3,524 | 5,094 | 613 |
| 1877 | 45 | 432 | 117 | 172 | 98 | 864 | 494,391 | 10,986 | 1,144 | 4,225 | 2,874 | 5,044 | 572 |
| 1878 | 31 | 456 | 94 | 146 | 84 | 811 | 475,329 | 15,333 | 1,042 | 5,056 | 3,255 | 5,658 | 586 |
| 1879 | 35 | 416 | 95 | 167 | 69 | 782 | 476,810 | 12,625 | 1,146 | 5,019 | 2,855 | 6,910 | 610 |
| 1880 | 28 | 445 | 77 | 177 | 88 | 815 | 484,933 | 17,319 | 1,089 | 6,297 | 2,739 | 5,510 | 595 |
| 1881 | 31 | 439 | 106 | 181 | 87 | 844 | 495,477 | 15,983 | 1,128 | 4,674 | 2,737 | 5,695 | 587 |
| 1882 | 35 | 459 | 101 | 197 | 84 | 876 | 503,987 | 14,399 | 1,098 | 4,989 | 2,558 | 5,999 | 575 |
| 1883 | 25 | 465 | 82 | 241 | 108 | 921 | 514,933 | 20,597 | 1,107 | 6,279 | 2,137 | 4,767 | 559 |
| 1884 | 30 | 470 | 72 | 198 | 93 | 863 | 520,376 | 17,345 | 1,107 | 7,227 | 2,628 | 5,595 | 603 |
| 1885 | 25 | 433 | 67 | 207 | 75 | 807 | 520,632 | 20,825 | 1,202 | 7,771 | 2,515 | 6,942 | 645 |
| 1886 | 21 | 453 | 70 | 178 | 85 | 807 | 519,970 | 24,760 | 1,147 | 7,428 | 2,921 | 6,117 | 644 |
| 1887 | 22 | 455 | 73 | 203 | 77 | 830 | 526,277 | 23,921 | 1,157 | 7,209 | 2,592 | 6,835 | 634 |
| Totals, 15 yrs. 1873—1887 | 499 | 6,670 | 1,530 | 2,820 | 1,335 | 12,854 | 7,634,520 | ... | ... | ... | ... | ... | ... |
| Averages . | 33 | 445 | 102 | 188 | 89 | 857 | 508,968 | 15,300 | 1,145 | 4,990 | 2,707 | 5,719 | 594 |
| *Coal Mines Regulation Act, 1887, applying to Coal, Stratified Ironstone, Shale, and Fireclay Mines, 50 & 51 Vict., Cap. 58.* | | | | | | | | | | | | | |
| 1888 | 15 | 454 | 68 | 202 | 82 | 821 | 534,945 | 35,663 | 1,178 | 7,867 | 2,648 | 6,523 | 652 |
| 1889 | 19 | 450 | 69 | 221 | 89 | 848 | 563,735 | 29,670 | 1,253 | 8,170 | 2,551 | 6,334 | 665 |
| 1890 | 22 | 418 | 85 | 235 | 101 | 861 | 613,233 | 27,874 | 1,467 | 7,214 | 2,609 | 6,071 | 712 |
| 1891 | 23 | 465 | 101 | 226 | 96 | 911 | 648,450 | 28,193 | 1,395 | 6,420 | 2,869 | 6,755 | 712 |
| 1892 | 12 | 421 | 82 | 223 | 76 | 814 | 664,300 | 55,358 | 1,578 | 8,101 | 2,978 | 8,741 | 816 |
| 1893 | 15 | 401 | 82 | 192 | 119 | 809 | 683,008 | 45,533 | 1,703 | 8,329 | 3,557 | 5,739 | 844 |
| 1894 | 22 | 434 | 69 | 176 | 112 | 813 | 705,240 | 32,056 | 1,625 | 10,221 | 4,007 | 6,296 | 867 |

# UNITED KINGDOM.

## COAL MINES REGULATION ACT.—DEATHS.

*Deaths* by accidents under each head.
Persons employed.
Ratio of persons employed to each death under each head.

(No. 7 SUMMARY.—Ratios of Deaths by the Accidents to the numbers of Persons employed in and about the Mines under the former and present Coal Mines Acts, exclusive of those on Private Branch Railways and Tramways, and in Washing and Coking Coal.)

| Year. | Deaths caused by the Accidents. | | | | | | Persons employed (A.) (B.) | Ratio of Persons employed to each Death. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fire-damp Explosion. | Roof and Sides Falling. | Shaft. | Miscellaneous Underground. | Miscellaneous Surface. | Total. | Above ground and below ground. | Fire-damp Explosion. | Roof and Sides Falling. | Shaft. | Miscellaneous Underground. | Miscellaneous Surface. | Total. |
| *Act for Inspection of Coal Mines in Great Britain, 1850, 13 & 14 Vict., Cap. 100.* | | | | | | | | | | | | | |
| Totals, 5 yrs. 1851—1855 | 1,155 | 1,842 | 1,183 | 509 | 238 | 4,927 | 1,147,341 | ... | ... | ... | ... | ... | ... |
| Averages . | 231 | 368 | 236 | 102 | 48 | 985 | 229,468 | 993 | 623 | 970 | 2,254 | 4,821 | 233 |
| *Act for Inspection of Coal Mines in Great Britain, 1855, 18 & 19 Vict., Cap. 108.* | | | | | | | | | | | | | |
| Totals, 5 yrs. 1856—1860 | 1,286 | 1,925 | 936 | 677 | 267 | 5,091 | 1,312,981 | ... | ... | ... | ... | ... | ... |
| Averages . | 257 | 385 | 187 | 136 | 53 | 1,018 | 262,596 | 1,021 | 682 | 1,403 | 1,939 | 4,917 | 258 |
| *Act for the Regulation and Inspection of Coal Mines and Ironstone Mines connected with Coal, 1860, 23 & 24 Vict., Cap. 151.* | | | | | | | | | | | | | |
| Totals, 12 yrs. 1861—1872 | 2,690 | 5,054 | 1,783 | 2,309 | 925 | 12,761 | 3,981,374 | ... | ... | ... | ... | ... | ... |
| Averages . | 224 | 421 | 149 | 192 | 77 | 1,063 | 331,781 | 1,480 | 788 | 2,233 | 1,724 | 4,304 | 312 |
| *Coal Mines Regulation Act, 1872, applying to Coal, Stratified Ironstone, Shale, and Fireclay Mines, 35 & 36 Vict., Cap. 76.* | | | | | | | | | | | | | |
| 1873 | 100 | 491 | 171 | 221 | 86 | 1,069 | 512,199 | 5,122 | 1,043 | 2,995 | 2 317 | 5 955 | 479 |
| 1874 | 166 | 413 | 154 | 214 | 109 | 1,056 | 538,829 | 3.245 | 1,304 | 3,496 | 2,517 | 4,943 | 510 |
| 1875 | 288 | 459 | 172 | 227 | 98 | 1,244 | 535,845 | 1,860 | 1,167 | 3,115 | 2,360 | 5.467 | 430 |
| 1876 | 95 | 449 | 129 | 149 | 111 | 933 | 514,532 | 5.416 | 1,145 | 3,988 | 3,453 | 4,635 | 551 |
| 1877 | 345 | 448 | 129 | 187 | 99 | 1,208 | 494,391 | 1,433 | 1,103 | 3.832 | 2,643 | 5.014 | 409 |
| 1878 | 586 | 469 | 111 | 161 | 86 | 1,413 | 475,329 | 811 | 1,013 | 4,282 | 2,952 | 5,527 | 336 |
| 1879 | 184 | 426 | 120 | 172 | 71 | 973 | 476,810 | 2,591 | 1,119 | 3.973 | 2,772 | 6,715 | 490 |
| 1880 | 499 | 462 | 91 | 178 | 88 | 1,318 | 484,933 | 971 | 1,049 | 5.329 | 2,724 | 5,510 | 368 |
| 1881 | 116 | 450 | 110 | 190 | 88 | 954 | 495,477 | 4,271 | 1,101 | 4,504 | 2,607 | 5,630 | 519 |
| 1882 | 250 | 468 | 116 | 208 | 84 | 1,126 | 503,907 | 2,015 | 1,076 | 4,344 | 2,423 | 5 999 | 447 |
| 1883 | 134 | 469 | 97 | 246 | 108 | 1,054 | 514,933 | 3.842 | 1,097 | 5,308 | 2,093 | 4,767 | 488 |
| 1884 | 65 | 482 | 88 | 213 | 94 | 942 | 520,376 | 8,005 | 1,079 | 5,013 | 2,443 | 5,535 | 552 |
| 1885 | 341 | 439 | 76 | 219 | 75 | 1,150 | 520,632 | 1,526 | 1,185 | 6,850 | 2,377 | 6,941 | 452 |
| 1886 | 129 | 461 | 86 | 188 | 89 | 953 | 519 970 | 4,030 | 1,127 | 6,046 | 2,765 | 5,842 | 545 |
| 1887 | 149 | 470 | 84 | 213 | 79 | 995 | 526,277 | 3,532 | 1,119 | 6,265 | 2,470 | 6,661 | 529 |
| Totals, 15 yrs. 1873—1887 | 3,447 | 6,856 | 1,734 | 2,986 | 1,365 | 16,388 | 7,634,520 | ... | .. | ... | ... | ... | ... |
| Averages . | 230 | 457 | 115 | 199 | 91 | 1,092 | 508,968 | 2.215 | 1,113 | 4,403 | 2,557 | 5,593 | 466 |
| *Coal Mines Regulation Act, 1887, applying to Coal, Stratified Ironstone, Shale, and Fireclay Mines, 50 & 51 Vict., Cap. 58.* | | | | | | | | | | | | | |
| 1888 | 49 | 471 | 75 | 209 | 84 | 888 | 534,945 | 10,917 | 1,136 | 7,133 | 2,560 | 6,368 | 602 |
| 1889 | 138 | 465 | 74 | 292 | 95 | 1,064 | 563,735 | 4,085 | 1,212 | 7,618 | 1.931 | 5.934 | 530 |
| 1890 | 290 | 434 | 88 | 245 | 103 | 1,160 | 613 233 | 2,114 | 1,413 | 6,968 | 2,503 | 5,953 | 528 |
| 1891 | 51 | 476 | 119 | 236 | 97 | 979 | 648,450 | 12,715 | 1,362 | 5,449 | 2,748 | 6,685 | 662 |
| 1892 | 123 | 435 | 91 | 255 | 78 | 982 | 664,300 | 5,400 | 1,528 | 7,300 | 2,605 | 8,517 | 676 |
| 1893 | 160 | 412 | 103 | 265 | 120 | 1,060 | 683,008 | 4,269 | 1,658 | 6,631 | 2,577 | 5,692 | 644 |
| 1894 | 317 | 444 | 77 | 177 | 112 | 1,127 | 705,240 | 2,223 | 1,589 | 9,159 | 3,984 | 6,297 | 626 |

# UNITED KINGDOM.

Quantities of each mineral wrought.
Number of accidents.
Number of lives lost.
Mineral wrought compared with accidents and lives lost.
Number of mines.

No. 11 SUMMARY.—Quantites of mineral wrought at mines under the Coal Mines Regulation Acts, number of fatal accidents and deaths, tons of mineral wrought per fatal accident and per death, and number of mines at work.

COAL MINES REGULATION ACT, 1872.

| YEAR. | TONS OF MINERAL WROUGHT. | | | | | Separate fatal accidents. | Lives lost by the accidents. | TONS OF MINERAL WROUGHT. | | Number of mines. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Coal. | Fireclay. | Ironstone. | Shale, etc. | Total. | | | Per fatal accident. | Per fatal life lost. | |
| 1873 | 128,680,131 | 1,742,193 | 12,094,827 | 524,095 | 143,041,246 | 973 | 1,069 | 146,867 | 133,677 | 3,938 |
| 1874 | 126,590,108 | 2,067,791 | 11,693,186 | 362,747 | 140,713,832 | 895 | 1,056 | 157,222 | 133,251 | 4,332 |
| 1875 | 133,306,485 | 1,932,294 | 12,018,594 | 442,940 | 147,700,313 | 927 | 1,244 | 159,331 | 118,730 | 4,501 |
| 1876 | 134,125,166 | 2,071,983 | 12,159,580 | 632,656 | 148,989,385 | 839 | 933 | 177,580 | 159,688 | 4,385 |
| 1877 | 134,179,968 | 1,813,541 | 12,014,356 | 838,395 | 148,846,260 | 864 | 1,208 | 172,276 | 123,217 | 4,231 |
| 1878 | 132,612,063 | 1,625,586 | 10,747,227 | 813,262 | 145,798,138 | 811 | 1,413 | 179,777 | 103,183 | 3,968 |
| 1879 | 133,720,393 | 8,455,003 | 9,387,766 | 303,207 | 145,366,369 | 782 | 973 | 185,890 | 149,400 | 3,956 |
| 1880 | 146,969,409 | 1,938,539 | 11,664,726 | 894,119 | 161,466,793 | 815 | 1,318 | 198,119 | 122,509 | 3,904 |
| 1881 | 154,184,300 | 1,896,907 | 11,858,766 | 1,019,958 | 168,959,931 | 844 | 954 | 200,189 | 177,106 | 3,847 |
| 1882 | 156,499,977 | 2,209,036 | 11,505,447 | 1,119,572 | 171,334,032 | 876 | 1,126 | 195,586 | 152,161 | 3,814 |
| 1883 | 163,737,327 | 2,189,452 | 11,495,401 | 1,341,210 | 178,763,390 | 921 | 1,054 | 194,097 | 169,605 | 3,707 |
| 1884 | 160,757,779 | 2,053,927 | 10,412,443 | 1,648,610 | 174,872,759 | 863 | 942 | 202,633 | 185,639 | 3,554 |
| 1885 | 159,351,418 | 1,878,514 | 10,108,612 | 1,885,416 | 173,223,960 | 807 | 1,150 | 214,651 | 150,629 | 3,488 |
| 1886 | 157,518,482 | 1,782,054 | 8,862,648 | 1,843,775 | 170,006,959 | 807 | 953 | 210,665 | 178,391 | 3,391 |
| 1887 | 162,119,812 | 1,810,490 | 7,569,918 | 1,549,575 | 173,049,795 | 830 | 995 | 208,494 | 173,919 | 3,382 |
| Totals for the 15 years | 2,184,352,818 | 28,467,310 | 163,593,497 | 15,719,537 | 2,392,133,162 | 12,854 | 16,388 | ... | ... | ... |
| Averages | 145,623,521 | 1,897,820 | 10,906,233 | 1,047,969 | 159,475,544 | 857 | 1,092 | 186,100 | 145,968 | 3,893 |

COAL MINES REGULATION ACT, 1887.

| YEAR. | TONS OF MINERAL WROUGHT. | | | | | | Separate fatal accidents. | Lives lost by the accidents. | TONS OF MINERAL WROUGHT. | | Number of mines. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coal. | Fireclay. | Ironstone. | Oil shale. | Other minerals. | Total. | | | Per fatal accident. | Per life lost. | |
| 1888 | 169,935,219 | 1,879,273 | 8,635,032 | 2,076,504 | 134,135 | 182,660,163 | 821 | 888 | 222,485 | 205,698 | 3,354 |
| 1889 | 176,916,724 | 2,192,346 | 8,270,542 | 2,014,860 | 239,184 | 189,633,656 | 848 | 1,064 | 223,624 | 178,227 | 3,389 |
| 1890 | 181,614,288 | 2,405,727 | 8,117,476 | 2,212,250 | 256,146 | 194,605,887 | 861 | 1,160 | 226,023 | 167,763 | 3,409 |
| 1891 | 185,479,126 | 2,394,065 | 7,229,150 | 2,352,471 | 238,780 | 197,693,592 | 911 | 979 | 217,007 | 201,934 | 3,439 |
| 1892 | 181,786,871 | 2,212,333 | 5,644,486 | 2,085,662 | 225,556 | 191,954,908 | 814 | 982 | 235,817 | 195,473 | 3,403 |
| 1893 | 164,325,795 | 2,186,243 | 6,560,189 | 1,956,520 | 208,110 | 175,236,857 | 809 | 1,060 | 216,609 | 165,318 | 3,383 |
| 1894 | 188,277,525 | 2,164,863 | 6,814,546 | 1,986,385 | 207,699 | 199,451,018 | 813 | 1,127 | 245,327 | 176,975 | 3,419 |

# UNITED KINGDOM.

## METALLIFEROUS MINES REGULATION ACTS.

Persons employed.
Number of accidents.
Number of deaths.
Persons employed compared with accidents and deaths.

(No. 12 SUMMARY.—Persons employed, number of fatal accidents and deaths, and ratios of the number of persons employed to the number of fatal accidents and deaths, in and about all the mines in the United Kingdom of Great Britain and Ireland with the Isle of Man, under the Metalliferous Mines Regulation Acts).

| YEAR. | PERSONS EMPLOYED. | | | TOTAL. | Separate fatal accidents. | Lives lost by the accidents. | PERSONS EMPLOYED. | | Death-rate from accidents per 1,000 persons employed. |
|---|---|---|---|---|---|---|---|---|---|
| | UNDER GROUND. | ABOVE GROUND. | | | | | Per fatal accident. | Per life lost. | |
| | Males. | Males. | Females. | | | | | | |
| 1874 . . . | 34,036 | 18,189 | 4,136 | 56,361 | 94 | 103 | 599 | 547 | 1·827 |
| 1875 . . . | 34,905 | 19,365 | 3,803 | 58,073 | 110 | 119 | 528 | 488 | 2·049 |
| 1876 . . . | 34,109 | 19,815 | 3,573 | 57,497 | 66 | 70 | 871 | 821 | 1·217 |
| 1877 . . . | 34,095 | 19,964 | 3,336 | 57,395 | 87 | 97 | 659 | 591 | 1·690 |
| 1878 . . . | 30,624 | 18,016 | 2,818 | 51,458 | 74 | 77 | 695 | 668 | 1·496 |
| 1879 . . . | 28,265 | 16,602 | 2,193 | 47,060 | 61 | 64 | 771 | 735 | 1·360 |
| 1880 . . . | 32,045 | 18,600 | 2,263 | 52,908 | 82 | 84 | 645 | 630 | 1·589 |
| 1881 . . . | 33,291 | 19,405 | 2,246 | 54,942 | 85 | 99 | 646 | 555 | 1·802 |
| 1882 . . . | 33,814 | 19,290 | 2,402 | 55,506 | 83 | 92 | 668 | 603 | 1·657 |
| 1883 . . . | 30,492 | 17,773 | 1,970 | 50,235 | 68 | 86 | 738 | 584 | 1·712 |
| Averages for the 10 years 1874 to 1883 inclusive. | 32,567 | 18,702 | 2,874 | 54,143 | 81 | 89 | 668 | 607 | 1·645 |
| 1884 . . . | 26,614 | 15,718 | 1,788 | 44,120 | 54 | 56 | 817 | 787 | 1·269 |
| 1885 . . . | 24,902 | 14,469 | 1,673 | 41,044 | 59 | 64 | 695 | 641 | 1·560 |
| 1886 . . . | 24,795 | 14,890 | 1,437 | 41,122 | 62 | 65 | 663 | 632 | 1·580 |
| 1887 . . . | 25,113 | 15,094 | 1,542 | 41,749 | 51 | 56 | 818 | 745 | 1·341 |
| 1888 . . . | 26,104 | 15,946 | 1,422 | 43,472 | 64 | 72 | 679 | 603 | 1·656 |
| 1889 . . . | 25,579 | 16,405 | 1,436 | 43,420 | 64 | 64 | 678 | 678 | 1·474 |
| 1890 . . . | 24,858 | 15,803 | 1,393 | 42,054 | 38 | 46 | 1,106 | 914 | 1·094 |
| 1891 . . . | 23,098 | 14,967 | 1,363 | 39,428 | 50 | 51 | 788 | 773 | 1·293 |
| 1892 . . . | 22,528 | 14,410 | 1,228 | 38,166 | 48 | 52 | 795 | 734 | 1·362 |
| 1893 . . . | 21,240 | 13,464 | 1,035 | 35,739 | 39 | 65 | 916 | 549 | 1·781 |
| 1894 . . . | 20,011 | 12,754 | 1,092 | 33,857 | 39 | 46 | 868 | 736 | 1·359 |

# UNITED KINGDOM.

*Table showing the annual mortality caused by accidents at the mines in the United Kingdom of Great Britain and Ireland, under the Coal Mines Regulation Acts, 1872 and 1887, to the persons employed above and below ground, during the past 22 years, 1873 to 1894 inclusive, together with the death-rate per 1,000 persons employed; the gross tons of mineral wrought; the number of tons raised per life lost; the out-put per person employed; and the number of mines.*

COMPILED FROM OFFICIAL RETURNS.

| Year. | Number of Persons employed. | | | Number of Deaths, and Death-rate per 1,000 Persons employed Below Ground and Above Ground. | | | | | | | | | | | | Gross Tons of Mineral Wrought. | | | Number of Mines. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | From Explosions of Firedamp. | | From Falls in the Mine. | | In Shafts. | | Miscellaneous Accidents Below Ground. | | Total Below Ground. | | Total Above Ground. | | Gross Total Below Ground and Above Ground. | | | Tons of Mineral Wrought. | | |
| | Below Ground. | Above Ground. | Total. | Total Deaths. | Deaths per 1,000 Below Ground. | Total Deaths. | Deaths per 1,000 Below Ground. | Total Deaths. | Deaths per 1,000 Below Ground. | Total Deaths. | Deaths per 1,000 Below Ground. | Total Deaths. | Deaths per 1,000 Below Ground. | Total Deaths. | Deaths per 1,000 Below Ground. | Total Deaths. | Deaths per 1,000 Below Ground. | Gross Statute Tons. | Per Life Lost. | Per Person employed. | |
| | | | | | | | | | | | | | | | | | | | Above and Below Ground. | | |
| 1873 | 407,808 | 106,341 | 514,149 | 100 | ·245 | 491 | 1·204 | 171 | ·419 | 221 | ·542 | 983 | 2·410 | 86 | ·808 | 1,069 | 2·079 | 143,041,246 | 133,677 | 278 | 3,938 |
| 1874 | 428,611 | 110,218 | 538,829 | 166 | ·387 | 413 | ·964 | 154 | ·359 | 214 | ·499 | 947 | 2·209 | 109 | ·988 | 1,056 | 1·959 | 140,713,832 | 133,251 | 261 | 4,332 |
| 1875 | 427,017 | 108,828 | 535,845 | 288 | ·674 | 458 | 1·072 | 172 | ·402 | 227 | ·531 | 1,145 | 2·679 | 99 | ·918 | 1,244 | 2·321 | 147,700,313 | 118,730 | 275 | 4,501 |
| 1876 | 409,229 | 105,303 | 514,532 | 95 | ·232 | 449 | 1·097 | 129 | ·315 | 149 | ·364 | 822 | 2·008 | 111 | 1·053 | 933 | 1·813 | 148,989,385 | 159,688 | 290 | 4,385 |
| 1877 | 395,025 | 99,366 | 494,391 | 345 | ·873 | 448 | 1·135 | 129 | ·326 | 187 | ·473 | 1,109 | 2·807 | 99 | ·990 | 1,208 | 2·443 | 148,846,260 | 123,217 | 301 | 4,231 |
| 1878 | 382,979 | 92,350 | 475,329 | 586 | 1·531 | 469 | 1·222 | 111 | ·289 | 161 | ·420 | 1,327 | 3·462 | 86 | ·931 | 1,413 | 2·972 | 145,798,138 | 103,183 | 307 | 3,968 |
| 1879 | 385,179 | 91,631 | 476,810 | 184 | ·477 | 426 | 1·105 | 120 | ·311 | 172 | ·446 | 902 | 2·339 | 71 | ·774 | 973 | 2·040 | 145,366,369 | 149,100 | 305 | 3,956 |
| 1880 | 391,381 | 93,552 | 484,933 | 499 | 1·275 | 462 | 1·180 | 91 | ·232 | 178 | ·455 | 1,230 | 3·142 | 88 | ·940 | 1,318 | 2·718 | 161,466,793 | 122,509 | 333 | 3,904 |
| 1881 | 399,387 | 96,090 | 495,477 | 116 | ·290 | 450 | 1·127 | 110 | ·275 | 190 | ·476 | 866 | 2·168 | 88 | ·811 | 954 | 1·925 | 168,959,931 | 177,106 | 341 | 3,847 |
| 1882 | 406,192 | 97,795 | 503,987 | 250 | ·615 | 468 | 1·152 | 116 | ·286 | 208 | ·512 | 1,042 | 2·565 | 84 | ·958 | 1,126 | 2·234 | 171,334,032 | 152,161 | 339 | 3,814 |
| Totals, etc. for 10 years. | 4,032,808 | 1,001,474 | 5,034,282 | 2,629 | ·652 | 4,534 | 1·124 | 1,303 | ·323 | 1,907 | ·473 | 10,373 | 2·572 | 921 | ·919 | 11,294 | 2·243 | 1,522,216,299 | 133,099 | 302 | 4,088 |
| 1883 | 416,696 | 98,237 | 514,933 | 134 | ·322 | 469 | 1·125 | 97 | ·233 | 246 | ·590 | 946 | 2·270 | 108 | 1·099 | 1,054 | 2·046 | 178,763,390 | 169,605 | 347 | 3,707 |
| 1884 | 422,233 | 98,143 | 520,376 | 65 | ·154 | 482 | 1·142 | 88 | ·208 | 213 | ·504 | 848 | 2·008 | 94 | ·956 | 942 | 1·810 | 174,872,759 | 185,639 | 336 | 3,554 |
| 1885 | 424,191 | 96,441 | 520,632 | 341 | ·803 | 439 | 1·034 | 76 | ·179 | 219 | ·518 | 1,075 | 2·534 | 75 | ·982 | 1,150 | 2·207 | 173,223,960 | 150,629 | 332 | 3,488 |
| 1886 | 423,862 | 96,108 | 519,970 | 129 | ·304 | 461 | 1·087 | 86 | ·203 | 188 | ·444 | 864 | 2·038 | 89 | ·821 | 953 | 1·833 | 170,006,959 | 178,391 | 327 | 3,391 |
| 1887 | 428,549 | 97,737 | 526,277 | 149 | ·347 | 470 | 1·097 | 84 | ·196 | 213 | ·497 | 916 | 2·137 | 79 | ·808 | 995 | 1·890 | 173,049,795 | 173,919 | 328 | 3,382 |
| 1888 | 438,902 | 96,043 | 534,945 | 49 | ·111 | 471 | 1·073 | 75 | ·171 | 209 | ·476 | 804 | 1·831 | 84 | ·874 | 888 | 1·660 | 182,660,163 | 205,698 | 341 | 3,354 |
| 1889 | 463,600 | 100,135 | 563,735 | 138 | ·297 | 465 | 1·003 | 74 | ·157 | 292 | ·629 | 969 | 2·086 | 95 | ·848 | 1,064 | 1·887 | 189,633,656 | 178,227 | 336 | 3,389 |
| 1890 | 506,812 | 106,421 | 613,233 | 290 | ·572 | 434 | ·856 | 88 | ·174 | 245 | ·483 | 1,057 | 2·085 | 103 | ·967 | 1,160 | 1·891 | 194,605,887 | 167,763 | 317 | 3,409 |
| 1891 | 536,091 | 112,359 | 648,450 | 51 | ·095 | 476 | ·888 | 119 | ·222 | 236 | ·440 | 882 | 1·645 | 97 | ·862 | 979 | 1·510 | 197,693,592 | 201,934 | 304 | 3,430 |
| 1892 | 549,312 | 114,988 | 664,300 | 123 | ·225 | 435 | ·791 | 91 | ·165 | 255 | ·464 | 904 | 1·645 | 78 | ·678 | 982 | 1·478 | 191,954,908 | 195,473 | 289 | 3,403 |
| Totals, etc. for 10 years. | 4,610,239 | 1,016,612 | 5,626,851 | 1,469 | ·318 | 4,602 | ·998 | 878 | ·190 | 2,316 | ·503 | 9,265 | 2·009 | 902 | ·886 | 10,167 | 1·985 | 1,826,465,069 | 179,646 | 324 | 3,451 |
| *1893 | 549,738 | 132,435 | 682,173 | 160 | ·287 | 412 | ·749 | 103 | ·187 | 265 | ·481 | 940 | 1·709 | 120 | ·900 | 1,060 | 1·552 | 175,236,857 | 168,148 | 257 | 3,383 |
| 1894 | 569,678 | 135,562 | 705,240 | 317 | ·556 | 444 | ·779 | 77 | ·135 | 177 | ·311 | 1·015 | 1·782 | 112 | ·826 | 1,127 | 1·598 | 199,451,018 | 176,975 | 283 | 3,419 |

* The persons employed on private branch railways and tramways, and in washing and coking coal on premises adjacent to or belonging to the mines (but which do not come under the Act) are included in these figures this year for the first time.

## 23.—NOTICE OF ACCIDENT FORMS.

**Mines, Form 24.**

*Notice of Accident Form. Schedule .*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Date of accident. | Hour of day or night. | Hour of person's shift, or how long been at work. | Name of the mine or colliery. | Situation of mine. | Description of mine or name of minerals wrought. | Name of the owner or Company. |
| 24th June 1894. | 8 P. M. . | 1st. . | Jamaria | Jamaria, Raniganj Sub-Division, Burdwan District, Burdwan Division, Bengal. | Coal | Kumar R. Malia, and Kumar D. Malia. |

| 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|
| Names and number of the persons killed, and whether male or female. | Names and number of persons seriously injured, and whether male or female. | Reputed Ages. | Occupations. | Cause of death in terms of Form 25,* and whether above or below ground. | Remarks on cause and nature of injury, and cause of death. |
| Lal Manjhi . | ..... | 23 | Coal-hewers. | In shafts. Whilst descending by machinery, below ground. | Three deaths by one accident. They fell down about 110 feet of the shaft, with the winding cage, but without the rope being attached. (An overwind? J. G.) |
| Bhein Manjhi, and Durga Manjhi. | ..... | 25 | | | |
| Three males. | ..... | 40 | | | |

* See back of this for terms of Form 25.

*Signed*_____

*Position at Mine*_____

*The following are the terms to be used in column 12:—*

1. Falls in mine.

   Fall of roof, stone, or coal.

2. Falls in mine.

   Fall of sides.

3. Falls in mine.

   Falls of coal in working places.

4. In shafts.

   Overwinding.

5. In shafts.

   Ropes and chains breaking.

6. In shafts.

   Whilst ascending or descending by machinery.

7. In shafts.

   Falling into shaft from surface.

8. In shafts.

   Falling from part way down.

9. In shafts.

   Things falling from surface.

10. In shafts.

    Things falling from part way down.

11. In shafts.

    Miscellaneous.

12. Miscellaneous below ground.

    Explosions of firedamp.

13. Miscellaneous below ground.

    Suffocation by gases.

14. Miscellaneous below ground.

    By explosives.

15. Miscellaneous below ground.

    Irruptions of water and falling into water.

16. Miscellaneous below ground.

    On inclined and engine planes.

17. Miscellaneous below ground.

    By trams or tubs.

18. Miscellaneous below ground.

    By machinery.

19. Miscellaneous below ground.

    By other causes.

20. On surface.

    By machinery.

21. On surface.

    Boilers and steam pipes bursting.

22. On surface.

    On railways or tramways belonging to mine.

23. On surface.

    Miscellaneous.

*Notice of Accident Form. Schedule*

AN ALTERNATIVE FORM.

1. Date of accident—**24th June 1804.**

2. Hour of day or night—**8 p.m.**

3. Hour of person's shift or how long been at work—**1st hour.**

4. Name of the mine or colliery—**Jamaria.**

5. Situation of mine—**Jamaria, Raniganj Sub-Division, Burdwan District, Burdwan Division, Bengal.**

6. Description of mine, or name of minerals wrought—**Coal.**

7. Name of owner or Company—**Kumar R. Malia, and Kumar D. Malia.**

8. Names and number of persons killed, and whether male or female—**Lal Manji, Bhein Manji, and Durga Manji. Three males.**

9. Names and number of persons seriously injured, and whether male or female.—

10. Reputed ages—**23, 25, and 40 respectively.**

11. Occupation—**All coal-hewers.**

12. Cause of accident in terms of Form 25, and whether above or below ground—**In shafts. Whilst descending by machinery, below ground.**

13. Remarks on cause and nature of injury, and cause of death—**Three deaths by one accident. They fell down about 110 feet of the shaft, with the winding cage, but without the rope being attached. (An overwind? J. G.)**

*Signed*_____

*Position of mine*_____

## 24.—FIRST AID TO THE INJURED.

The best means of rendering simple but effective first aid to the injured has been taught and well practised throughout the year at the East Indian Railway Company's collieries at Giridih. This aid is such as will tend to prevent the injured person being still further injured after the accident is over; it is promptly applying such treatment as is necessary before the doctor arrives; getting the doctor quickly to serious cases; and conveying the patient in the best way.

### The Kolar mines.

There was a most excellent hospital and medical staff for these mines, but the absence of first aid appliances *at* the mines and persons who had been taught how to properly give first aid was a great want. It appeared very evident that such aid would save much suffering and probably many lives, and was an urgent necessity. I am glad to be able to record that all the mine Superintendents, and the very able medical officer promised to take the matter in hand at once, and I sincerely trust they have done so.

### The Warora mine.

Ambulance stretchers were kept at the pit top ready for use, and were used below ground where they were thought to be required. The hospital with suitable equipment and native doctor in charge was on the mining premises quite close to the workshop and to some of the pits, and was being improved by a new and more convenient building.

### The Mohpani mine.

An ambulance stretcher was kept ready for use, and the hospital dispensary was very near and accessible, and the doctor always available and ready to go to where he might be wanted.

### The Umaria mine.

They had no ambulance apparatus just at the mine, but I was told that two ambulance stretchers would be got ready at once. The hospital dispensary was very conveniently close to the mine, with room for 12 patients on beds, and a qualified medical staff in constant attendance. But a hospital, though very near the mine, and however well equipped and kept ready, cannot take the place of "first aid" treatment. I wish to lay some stress on this, because the impression amongst officials appears to be that if they have a doctor and a dispensary conveniently near to the mine, they have provided all that can be required. But cases have happened in India where treatment that would probably have saved a man's life might have been applied even before the man could be released from his perilous position where he was slowly bleeding to death. Some injuries require some immediate treatment, and the injured person has to be got out of the mine and to the doctor, and to do this in the best way without further injuring him requires some first aid knowledge, and such knowledge may save much pain and injury during the removal, even though there be no proper ambulance or other apparatus at hand. This was painfully impressed on me during the removal of a dying hewer from this mine to hospital, as I saw him rolling his head about as if trying to find an easy place while being carried shoulder high on a sheet of corrugated iron, and without anything under him or to cover him. I was afraid he would

fall off while being carried the short distance from where I first saw him to the hospital; but those were really his last struggles, for he never left that sheet iron bed alive.

## The Singareni mine.

A doli (dooly) with pole is kept ready to carry injured persons. The hospital, with medical staff, is always available and near to the miner and a new branch dispensary was to be built at once almost in the centre of the mining property.

## The teaching and practice of first aid in England.

The teaching and practice of first aid to the injured has been well carried out in England for many years under the influence and directions of the St. John's Ambulance Society. Both officials and workmen at mines, mills, foundries, and workshops have been taught, examined, and received certificates and medals. Similar classes have also been held in the police forces and other public bodies. And it has recently received an impetus at mines by the Home Secretary officially requesting the Inspectors of mines to encourage such teaching and practice in their own districts. And one of the Inspectors reported this year to the Secretary of State as follows:—

"In accordance with your wish I have encouraged the teaching of ambulance or first aid to the injured, and am glad to report that this subject is now being taken in hand and encouraged by the Lancashire County Council under the Technical Education Scheme; classes have also been established at the Wigan Mining School, and they appear to be very popular, and will be continued from year to year as a part of the teaching of the school. Some of the more important collieries have established, and are supporting ambulance classes at their own cost, and make it a rule that their officials must attend and become efficient. I believe it would be of great public benefit if ambulance were systematically taught by the technical schools throughout the country."

In at least one of the inspecting and examining districts of the United Kingdom "The treatment of injured persons as recommended by the St. John Ambulance Association" is made a subject of examination for colliery manager's certificates, and questions are set thereon.

## First aid in India.

The managers of many of the mines in India are often called upon act the part of an amateur doctor, and I believe they most often do it well, though probably they may sometimes do a little harm. It appears that the medical officers who make periodical visits to mines might do a great deal of good by advising and guiding the officials in first aid principles and work, and by giving some useful instruction, not as to how mine managers may add to their very many and onerous as well as honorary duties by becoming amateur surgeons, but how they may relieve pain, save life, and make the doctor's work more efficient; as well as by instructing them in the things they ought *not* to do.

## 25.—RULES AND REGULATIONS AT INDIAN MINES.

There are printed rules in a small way, and in force in a mild form at a few mines; and at other mines, such for example as the Kolar Gold mines, rules are being drawn up by the mine officials who are anxious to have them invested with the force of law. At a few of the mines there are full printed rules in book form that are very near to being literal copies of English rules with a little attempt to adapt them to Indian mining; but lacking as they do the force and recognition of law they are of very little use, apparently very little referred to and very little known. The following is the result in brief of enquiries as to existing mining rules.

*Mines having printed rules for the regulation of the work and workmen.*

| No. | Name of Mine. | Particulars. |
|---|---|---|
| 1. | South East Mysore Mine. | Have printed rules in English and Tamil regulating use and storage of explosives. These are posted up and read out weekly to every shift of men in their own languages. |
| 2. | Mysore Reef. | Ditto ditto ditto. |
| 3. | Nundydroog. | Yes; there is a small set of rules; those referring principally to the use of explosives are posted up near the top of the shaft. |
| 4. | Nine Reefs. | Have written rules posted up in changing house at Vyvyan's Shaft prohibiting the taking of explosives to the workmen's houses, written in Urdu, Tamil, and Kanarese. |
| 5. | Coromandel Gold Mine. | Have only notices posted to be read for prohibiting riding in the shaft skips; and the rules connected with the Medical Department and Dispensary. |
| | (For all Mysore Mines). | A code of rules have been recently drafted for application to all the Kolar Gold Mines. |
| | | All Europeans are under a signed agreement that regulates their actions at the mines. |
| 6. | Warora. | There is a proper and full code of printed rules, but they apparently have no force in law. There are also written notices, and directions and instructions used by officials from time to time. |
| 7. | Mohpani. | Have printed general rules and each official has a copy. An effort is made to enforce them. There are also extra written rules for short-firing and sinking. |
| 8. | Umaria. | Have a printed set of general and special rules that are enforced as far as possible; breaches of these are punished by fines or by the law if the case can be brought under the Penal Code. Extracts from the rules and other notices are posted up. All orders are given in writing. |
| 9. | Serampore. | Have printed rules for various purposes, Benefit Fund, and for signalling; and posted at pit top and in office, are rules for the guidance of officials, and each officer has copy. |
| 10. | Kurhurbaree. | |
| 11. | Raniganj Coal Association (Booriadih). | Yes; local rules in the form of orders and circulars for the working of the colliery and guidance of the officials are in force, and through officials to work persons for the prevention of accidents and to secure proper discipline. A copy of the C. M. R. Act, 1887, is given to each assistant in charge and kept in offices, with a view to carrying out its provisions in so far as is applicable. |

*Mines having printed rules for the regulation of the work and workmen*—contd.

| No. | Name of Mine. | Particulars. |
|---|---|---|
| 12. | Mooduncotta. | No rules or regulations posted up. As far as possible they carry out the general and special rules of the New English Mines Act of 1887. Reports are recorded daily, so that proper discipline over every department is closely observed and attended to. |
| 13. | Seebpore. | Have written rules to secure examination and cleaning of boilers and engines, and other machinery. |

## Special Rules.

It may be useful to insert here a form of notice something similar to the notices used in England when establishing special rules, and such as is made compulsory by the Mines Regulation Acts. Such a notice as this would serve a useful purpose when establishing rules at Indian Mines to give any one an opportunity of offering objections or making recommendations; but the notice should be posted up in a conspicuous place, and be in the language best known to the people affected by it and by the rules.

## Proposed Special Rules.

Any person breaking any of these rules after they are established will be liable to the penalties imposed by the Indian Mines Act, 189 .

**Date of publication_____**

Any objections to these proposed rules on the ground of anything contained therein, or omitted therefrom, by any person employed at, or having any interest in this mine, may be made in writing within a period of 30 days from the above date, to the Inspector of Mines.

## 26.—EXPLOSIVES.

Closely connected accidents, and bearing on many matters that should be known to prevent them, as well as when devising rules to prevent and lessen their number is the important question of explosives. I have not dwelt on this highly important question with anything like the fullness its importance tempted me to do, but have given a few notes that should be generally known and appreciated in substance in the hope that they will create a greater wish to understand more of this subject, and play some small part towards keeping down accidents from such causes to a minimum.

There are many ways in which instruction may be imparted on the most useful branches of mining knowledge to those most in need of it, and I trust something will be done before long towards a regular and systematic scheme of instruction.

As a preliminary to what follows on explosives, I give some figures showing some of the kinds and quantities of explosives used at the gold mines of Kolar, and the coal mines of Hyderabad (Deccan) and the Central Provinces.

The following particulars show the importance of rules for regulating the use of explosives.

*Amounts of explosives used and the approximate number of shots fired*

| Kolar Gold Mines. | Dynamite. | | | | Blasting Gelatine. | | | | Gelignite. | | | | Detonators. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name of Mine. | 1892. | 1893. | 1894. | Amount per month. | 1892. | 1893. | 1894. | Amount per month. | 1892. | 1893 | 1894. | Amount per month. | 1892. | 1893. | 1894. | Number per month. |
| | lbs. | lbs. | lbs. | lbs. | lbs. | lbs. | lbs. | lbs. | | | | | Number. | Number. | Number. | |
| Mysore Reefs | 1,012 | Nil. | Nil. | 202 | 9,843 | 2,972 | 7,000 | 550 | ... | ... | ... | ... | 6,050 | 6,850 | 16,100 | 805 |
| South East Mysore | 3,870 | 2,765 | Nil. | 331 | Nil. | 130 | 3,915 | 311 | ... | ... | ... | ... | 7,600 | 5,770 | 8,700 | 920 |
| Mysore Mine | Nil. | 1,010 | Nil. | ... | 116,880 | 86,775 | 63,945 | 7,993 | 3,323 | 7,274 | Nil. | ... | 164,989 | 185,000 | 150,000 | 18,700 |
| Champion Reef | 23,300 | 23,638 | 8,235 | 1,163 | 26,833 | 67,281 | 63,510 | 10,160 | ... | ... | ... | ... | 73,057 | 142,183 | 92,820 | 20,100 |
| Oorgaum | 98,140 | 78,111 | 31,657 | 4,450 | Nil. | 23,740 | 44,210 | 5,390 | ... | ... | ... | ... | 181,300 | 210,000 | 143,200 | 21,700 |
| Nundydroog | 7,065 | Nil. | Nil. | 588 | 49,800 | 73,983 | 61,941 | 6,882 | ... | ... | ... | ... | 91,400 | 135,233 | 100,934 | 12,000 |
| Tank Mine | 5,532 | 2,880 | 1,257 | 293 | 4,865 | 6,282 | 3,715 | 450 | ... | ... | ... | ... | 13,070 | 15,060 | 9,700 | 1,146 |
| Coromandel | 720 | 5,864 | 3,485 | 435 | Nil. | 1,025 | 7,260 | 907 | ... | ... | ... | ... | 3,530 | 19,822 | 18,400 | 2,300 |
| Balaghat | 18,226 | 14,627 | 4,760 | 595 | Nil. | 10,713 | 9,509 | 1,188 | ... | ... | ... | ... | 88,842 | 106,330 | 50,470 | 6,308 |
| Nine Reefs | 855 | 4,915 | 2,680 | 1,284 | Nil. | 3,290 | 2,265 | 283 | ... | ... | ... | ... | 2,138 | 17,265 | 12,712 | 1,284 |
| Gold Fields of Mysore | 2,145 | 2,000 | 2,300 | 287 | Nil. | Nil. | Nil. | Nil. | ... | ... | ... | ... | 1,990 | 12,100 | 12,109 | 1,513 |
| | Dynamite per month | | | 9,928 | | | | 34,114 | | | | | | | | 86,776 |

9,928 lbs. of Dynamite used per month; and 34,114 lbs. of Blasting Gelatine used per month, or a total of 44,042 lbs. or over 19 tons of explosives per month.
The number of detonators used per month, 86,776, is approximately the number of shots fired in the same time.
During 1891 there were 9 persons killed from explosives.
" 1892 " " 12 " " " "
" 1893 " " 12 " " " "
" 1894 " " 12 " " " "

| No. | Name of Mine. | Particulars of explosives used. |
|---|---|---|
| 1 | Warora | Use.—English compressed blasting powder; country made blasting powder; safety fuze; and electric fuzes. 3,000 to 6,000 shots are fired per month, requiring 10 cwts. to 12 cwts. of powder per month. |
| 2 | Mohpani | Use.—Country-made powder; a little English powder; Gelatine dynamite; detonators; cotton covered and gutta-percha fitted safety fuze. About 150 shots are fired per month. |
| 3 | Umaria | Use.—Country and English powder; dynamite; tonite; and safety fuze. Fire about 9,000 to 10,000 shots per month. |
| 4 | Singareni | Use.—The explosives used are principally English blasting powder; dynamite; and common fuze for gunpowder, and best fuze for dynamite; country blasting powder has also been tried. From 20,000 to 30,000 shots are fired per month. |

Detonators.—

Detonators are, as commercially used, metallic capsules, usually of copper, and resemble very long percussion caps. There are eight sizes usually made, which vary in the dimensions and in the amount of explosive contained in them. The explosive is pure fulminate of mercury, or a mixture of the same with chlorate of potash and occasionally other substances. They are further distinguished as singles, doubles, trebles, etc., according to their number.

For example:—

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| No. 1 | contains | 300 | grammes, | or | 10·581 | oz. avordupois, | of explosive | in 1,000 detonators |
| No. 2 | „ | 400 | „ | | 14·108 | „ | „ | „ „ |
| No 3 | „ | 540 | „ | | 19·046 | „ | „ | „ „ |
| No 4 | „ | 650 | „ | | 22·926 | „ | „ | „ „ |
| No. 5 | „ | 800 | „ | | 28·216 | „ | „ | „ „ |
| No. 6 | „ | 1,000 | „ | | 35·270 | „ | „ | „ „ |
| No. 7 | „ | 1,500 | „ | | 52·905 | „ | „ | „ „ |
| No. 8 | „ | 2,000 | „ | | 70·540 | „ | „ | „ „ |

As a rule "trebles" are used for ordinary dynamite, but stronger ones (5, 6, or 7) for guncotton, blasting gelatine, roburite and other high explosives used for mining purposes. It is very false economy to use too weak a detonator; and it is clear from the above figures that though No. 3 strength is sufficient for dynamite, the same detonators should not be used for blasting gelatine and other explosives that require strength No. 6, the latter being 1·85 times the strength of No. 3, or trebles. Where a variety of explosives are used, such as dynamite, blasting gelatine, and gelignite, as for instance at the Mysore gold mines, they also use No. 3, and No. 6, detonators, and as a consequence the weak detonators are sometimes used with explosives requiring No. 6, and bring about misfires, and partially fired charges, with the unexploded portion left in the shot-hole sometimes burning away and giving off very deadly fumes. I think there is very little room for doubt that this misuse of detonators has been, and is even now regularly, the cause of much trouble, and many very serious accidents resulting in the loss of many lives.

There is not the same objection to using a powerful detonator to fire off a charge that would be fully detonated with a weaker detonator. The great dangers arising from the use of too weak detonators has led me strongly to the conclusion that a detonator of abundant strength should always be used, and that only one strength of detonators should be used or in any way provided or allowed where there is any likelihood of the wrong strength being used.

It should also be understood and made well known to all persons using or in any way likely to become possessed of detonators that they are a peculiarly very powerful explosive, the fulminates that form the principal part of their composition are amongst the most powerful and delicate explosives, and will readily explode by heat, a small blow, a little friction, and by other means; they should therefore be carefully stored, handled, and used. A great many accidents happen every year through ignorant practices with detonators.

Another very dangerous practice that I have found in India is the fitting of the fuze and detonator into the priming cartridge some distance away from where it is to be used, and often a considerable time before it is required for firing. This is sometimes done on the surface for a shot that is to be fired below ground. When the explosive is away from the detonator it can be safely handled and carried,

but when connected with the detonator it is in the best possible condition for exploding. It is to be hoped that more intelligence and greater thoughtfulness will be brought to bear on all matters connected with such a dangerous part of mining practice.

## Precautions when dealing with explosives.—

I may well quote the following precautions that have before been published in a somewhat similar form:—

1. Never attempt to thaw frozen dynamite by roasting, toasting, or baking it. It follows that it is unsafe to put it in heated vessels or on boilers, or before fires or heated metals.
2. Never put a detonator into a charge or primer until you are ready to use it. After the primer and detonator are prepared, never let them leave your hands until they are in the shot hole.
3. Keep the detonators away from dynamite or other explosives, and never let them come near each other except when being used.
4. Invariably prepare your primer at a distance from all other explosives.
5. Never allow smoking, an open light, or any fire to be near an explosive, to do so may cause a violent explosion in many ways.
6. Never use a metallic rammer.
7. Do not get nitro-glycerine on your fingers from dynamite, because it will be absorbed by the skin and give you headache and other bad effects.

## Fumes from explosives.

### Country and other blasting powders.

It is pretty well known that the ordinary description of English blasting powder is a mixture of 75 parts of saltpetre, 15 of charcoal, and 10 of sulphur in 100 parts by weight; and that French and other powders vary a little in the proportions of charcoal and sulphur. There is a great deal of country blasting powder used at Indian mines, and its most noticeable physical property appears to be that it contains a large proportion of cheap charcoal. The Superintendent of the Government of India Gunpowder factory at Ichhapur has very kindly informed me that the following gases are given off in the combustion of ordinary English blasting powder, *viz.*:—

In every 100 volumes of gas produced,

| | | |
|---|---|---|
| 49·2 | volumes of | $CO_2$. Carbon dioxide, |
| 20·3 | ,, | CO. Carbon monoxide, |
| 2·0 | ,, | H. Hydrogen, |
| 0·3 | ,, | $CH_4$ Marsh gas, or firedamp, |
| 7·0 | ,, | $H_2S$. Sulphuretted hydrogen, |
| 21·2 | ,, | Nitrous oxide, |
| 100·0 | | |

considering the very poisonous nature of the carbon monoxide, the above mixture of gases, or gunpowder fumes has the appearance of being almost a deadly poison, and should certainly not be breathed with impunity as they so often are by workmen and shotfirers who know or think nothing of their poisonous nature. I regret I am not in possession of the analysis of samples of country powder, but would expect it to give off even a greater proportion of foul and poisonous gases than the well proportioned and properly mixed English powder;

and I here draw special attention to this matter with a view to impressing mine officials with the great desirability of *preventing* men going into places where shots have recently been fired before the poisonous fumes have been cleared away by the ventilation. The workmen know no better than do such things and do not know what is the cause of their headaches, sickness, and pains. I have seen Indian miners standing quite needlessly in very dense fumes in which they could not see or do anything, and could barely live, but they were standing in the fumes waiting for them to clear away when they could as easily and as well have stood in the fresh air. Such foolish things are similarly done by English miners who generally know the consequences. The many deaths caused by breathing the fumes of burning explosives at the Kolar gold mines, Mysore, is very ample and tangible proof of the deadly nature of such poisonous gases. Since my inspection of those mines, there has been an accident there by which 16 persons lost their lives at one time by being poisoned through breathing the fumes of burning explosives.

The following table drawn up by an explosives chemist shows the poisonous gases given off when various mining explosives are fired:—

| | Carbonic acid gas. | Combustible gases. | |
|---|---|---|---|
| | | Carbonic oxide. | Hydrogen and marsh gas. |
| Blasting powders. | | | |
| Gunpowder | 50·6 | 10·5 | 3·1 |
| Blasting powder | 33·1 | 33·7 | 7·1 |
| Sprengel explosives. | | | |
| Roburite, Ammonite, Bellite, etc. | 32 | *Nil.* | *Nil.* |
| Nitro-Glycerine explosives. | | | |
| Nitro-Glycerine | 63 | *Nil.* | *Nil.* |
| Gelignite | 35 | 7 | *Nil.* |
| Carbonite | 19 | 15 | 26 |
| Blasting Gelatine | 3·5 | 32·5 | 3·6 |
| Nitro-Cotton explosives. | | | |
| Tonite | 30 | 6 | *Nil.* |

## Poisonous nature of carbonic oxide.

As the quantities of carbonic oxide gas shown above is attributed to the presence of an excess of carbonaceous material in the explosives, added generally to cheapen the article, so may we expect the fumes from country powder to contain a large proportion of that gas for the same reason. The dangerous poisonous nature of carbonic oxide gas is evident enough when it is known to have been stated to be very deleterious to health when present in the air in even the smallest quantities, and that one half of one per cent. in the air might be fatal to life. Owing to the great danger not being properly recognised it is not noticed or known how many poor miners have suffered serious illness and died from breathing the noxious fumes given off by the explosives they so simply but ignorantly used; or how much suffering such procedure is daily causing that could be very easily avoided without any loss to any one.

## 27.— WINDING ROPES.

*Winding Ropes at Indian Mines.*

| Name of mine or Colliery. | Thickness of ropes. | Average life. | How long been in use. | Remarks. |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Kurhurbaree . . | 3½″ to 2¾″ Cir. | 1 year 7 months to 5 years. | 1 year 10 months to 5 years 2 months. | |
| Serampore . . | 3½″ to 2¼″ Cir. | ..... | 2 years 4 months. | |
| Raniganj Coal Association Giridih Mines. | ¾″ to 1¼″ | ½ years, regularly worked. | ..... | |
| Mudhabpur Colliery . | ¾″ to 1″ Dia. | 3 to 6 years. | ..... | |
| Nimcha . . . | ¾″ to 1″ Dia. | 3 years. | ..... | Average life at one shaft much less than three years. |
| Laikdee . . . | ¾″ Dia | 3 to 4 years. | 2 years. | |
| Sodepore . . | 1″ Dia. | On inclines, 2 years. | Inclines, 13 months. | |
| | | On pits 4 to 5 years. | Pits 6 months to 5 years. | |
| Sanctoria . . | ¾″ to 1″ Dia. | On inclines, 1 to 2 years. | 1 week to 3 years. | |
| | | On pits 4 to 5 years. | | |
| Kendua . . . | 1″ Dia. | Not known. | 2 and 14 months. | |
| Singaren Valley Coal Concern. | Not given. | 12 to 15 years. | 2 years. | |
| Damuda Coal Company. | 2½″ Cir. | 4 years. | ..... | |
| Borrea . . . | ½″ to 1″ Dia. | .. ... | ..... | Keep regular record but not given. |
| Belrooi . . . | 2⅜″ Cir. | 3 to 4 years. | 1 year. | |
| Dhadka Colliery . | ¾″ to ⅞″ Dia. | 4 years. | 2 to 3½ years. | |
| Deshurghar „ . | ¾″ to 1⅛″ Dia. | On inclines 6 to 9 months. | ..... | |
| | | On pits 18 months. | | |
| Luchipore „ . | ¾″ & ⅞″ Dia. | 2 years. | ..... | |
| Baraboni „ . | ¾″ to 1″ Dia. | 2 years. | ..... | |
| Sibpur „ . | 2¼″ Cir. | Not known. | A few months. | |
| Kuldiah „ . | ..... | 2 to 3 years. | 4 to 5. | |
| Munghulpur „ . | ..... | ..... | 2 years. | |
| Roghunath Chak Colliery. | ½″ Dia. to 1″ | Not | known. | |
| Searsole . . . | ¾″ Dia. | Not | known. | |
| Charanpore . . | 3¾″ to 2¾″ Cir. | 4 to 5 years. | ..... | |
| Mooduncotta . . | ¾″ to 1¼″ Dia. | 1½ to 4 years. | 1 to 4 years. | |
| Warora . . . | 2¼″ to 1½″ Cir. | Not known. | 6 months to 2½ years. | Average life not known, but a record is now being kept. |
| Mohpani Coal Association. | 3¼″ to 2¼″ Cir. | 2 to 3 years. | 1⅔ to 2½ years. | |
| Umaria Colliery . | 2⅝″ to 2¼″ Cir. | ..... | 9 months to 7 years. | |
| Singareni . . | 3⅛″ | 2 years. | 15 months. | No 1 incline rope has only been in use a few months. |
| Gold Fields of Mysore Mine. | ⅞″ Dia. | ..... | About 1 year. | |
| Nine Reefs Mine . | ¾″ to 1″ Dia. | 3 years. | 5 to 16 months. | Hemp ropes changed in two months. |
| Balaghat „ . | 1″ to 1¼″ Dia. | 3 years. | 2 years. | |
| Coromandel Gold Mine. | 1″ to 1¼″ Dia. | ..... | 1 to 2 years. | |
| Tank Mine . . | 2″ Cir. | 8 months. | 3 months. | |
| Nundydroog Mine . | 1″ Dia. | 9 months. | 6 to 10 months. | |
| Oorgaum . . | ⅝″ & 1″ Dia. | 6 months. | ..... | Turned end for end in about 3 months. |

| Name of mine or colliery. | Thickness of ropes. | Average life. | How long been in use. | Remarks. |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| Champion Reef . | 1⅛″ Dia. | 1½ years. | 2 years. | |
| Mysore Mine . . | ¾″ to 1¼″ Dia. | 6 months Rowse's shaft, present rope 6 weeks, other ropes about 1 year. | | |
| South-East Mysore Mine. | 4½″ to 2½″ Cir. | Nearly new ropes. | | |
| Mysore Reef . . | 2¾″ to 4¼″ Cir. | 8 years of one. Others not known. | 12 months in No. 1 vertical shaft. 9 months on underlay shaft. Others new. | |
| Honnali . . . | 1″ Dia. | ..... | 3 years. | |
| Kempinkote . . | ⅝″ & ⅞″ Dia. | Not yet determined. | 2 years, 4 weeks. | |

## Wire ropes—

The preceding statement of particulars of colliery winding ropes in use at Indian mines was prepared for the mining rules and regulations committee. I found there were differences of *opinion* amongst rope users and others relative to ropes, pulleys, etc., and I prepared the statement as one small contribution towards replacing opinions by facts. There are many matters as well as this on winding ropes upon which there is plenty of scope for replacing opinions by facts and by carefully collected and prepared results of actual working and tests. The daily safety of so many lives, indeed twice each day, depend on the winding ropes, and are unquestionably risked and exposed to whatever danger there may be, and whatever may be added by the carelessness, wilfulness, or inexperience of the enginemen that every possible effort should be made to secure the maximum of safety and the minimum of danger, and to justify the risks that workmen so expose themselves to in good faith that their safety does receive all needful attention, and that they would not be expected or allowed to so trust their lives if everything was not believed to be quite safe. Workmen do accept on trust whatever guarantee they may receive as to the safety of winding ropes, and most machinery. It would be unusual, and often most inconvenient and useless for workmen to make a proper and regular examination of such things for themselves, though it is so often a matter affecting their safety so much ; therefore, it devolves upon all those who have charge of mines, and the control of men and machinery to do all that is reasonably possible to secure safety. This matter of winding ropes is one of such high importance at almost all mines, at all mines without exception where persons ride in shafts, and no less in India than at mines in other parts of the world ; that I think I ought to make a few further observations on the subject ; and more especially so since some of the leading Indian mine managers have recently given me a surprise by stating in effect that some of the leading points are principally commercial questions, the principal consideration being that if ropes are badly treated, or used under improper conditions, it only means buying a new rope. Such statements were expressed in the sense that

safety did not enter largely into the question. I was unaware, previously to this, that any one would question the predominant position that the question of safety has always occupied in the consideration of matters relating to winding ropes. It will be seen that the question of safety is a prominent one in India when the number of accidents happening in a year from various causes, and especially in shafts is taken into account.

During the year 1894, there were 18 persons killed and two other persons seriously injured in the shafts belonging to Indian Mines, *exclusive* of a number of deaths from accidents in the shafts of the Mysore Gold Mines. The deaths from accidents in shafts, exclusive of Mysore Mines, amounted to 24 per cent. of the total deaths below ground, or 21·17 per cent. of the deaths from all causes above and below ground. There was 1 death returned from overwinding, but it *appears* there were three persons killed by one case of overwinding, these are included in another section. By ropes and chains breaking there were 2 deaths returned. Four deaths were returned "whilst ascending or descending by machinery," which was over 22 per cent. of the total deaths in shafts, and 4·7 per cent. of the total deaths. There were also 2 deaths and 1 person seriously injured from miscellaneous causes in shafts. Indian mines, then, may well be said to have a very high record of fatal accidents from sundry causes in shafts. It is indeed a high and a bad record for such a small number of shafts; and although the shafts are so shallow that the sum of the depths of all the shafts would only be a small number of feet. The deepest coal mine shaft in India, at the present time, is probably the Jubilee pit of the East Indian Railway Company's Kurhurbaree Colliery, Giridih, which is 650 feet deep; but this deepest pit is probably a less number of feet deep than the *average* of the depths of all the pits in the United Kingdom; and the deepest pit in Lancashire, England, is five times the depth of the Jubilee pit at Giridih. Rope users in India have the disadvantage of being less brought into direct contact with good and reliable rope-makers than is the case with users in England. This state of things leaves them more dependent on, and more in the hands of dealers who know much less about the ropes they sell, and whose prestige is very much less affected by the sale of an inferior rope than would be that of a well known, responsible and honourable rope-maker. The force of this may be impressed by stating the facts that rope-makers vary much both in the kind and in the quality of the ropes they make, and it has often been stated that there are makers who provide cheap but inferior rope for users who attach most importance to a low first cost. Again, very few rope-makers prepare their own steel though so much of the quality of the ropes made depends on the material from which they are made. But in the case of some of the best makers almost every means in their power is taken to ensure that the material used shall be uniformly good, and that the whole of it comes up to a standard of quality that experience has shown to be necessary. On the other hand, some rope-makers are merely wire winders, for they do not even draw the wire they use for making their ropes, and therefore trust to others not only as to quality of material, but also as to annealing and the temper of the wire, a property that may make all the difference in the quality and value of the rope, and may, when

tested, give wrong impressions as to quality unless the tests are sufficiently complete to cover all the points.

## Purchasing ropes—

Some large and very important rope users, as for instance, some of the large collieries in England, believe they get the best results, and combine economy with safety and efficiency by only purchasing from the very best makers; and instead of requiring their ropes to comply with a furnished specification that might contain impracticable requirements, and probably lead to the production of an unsatisfactory rope, they send the particulars of the conditions under which the rope will have to work, and request the rope-maker to supply a suitable rope. This system of buying ropes appears to work very well in practice, and to give good results with very few exceptions. Other large users again rely more on their own knowledge of wire and ropes, and the best workable conditions to be fulfilled, and when ordering ropes set out certain requirements in the form of a short specification, and also give some of the conditions under which the rope will have to work.

## Working conditions of ropes—

The particulars supplied to the makers when ordering ropes might well include: 1, maximum load; 2, particulars of speed of work; 3, to what extent likely to be subjected to shocks; 4, sizes and particulars of drums, pulleys, side or bottom pulleys, and of all bending and turning to which the rope would be subjected; 5, particulars of all sources of rubbing, friction, or pressure, including the coiling of the rope on itself on the drum, and any due to drum and pulleys, etc., not being in a straight line; 6, whether shaft is wet or dry, upcast or downcast, filled with noxious and acid gases and vapours, or subjected to changes of temperature. A few other special conditions would apply to special cases, such as when the rope is to be used on a clip pulley, or on a non-slipping pulley, or drum; or when the pulley or drum is worn into grooves, or the pulley groove is not quite wide enough for the size of rope required. The extra strain brought on the rope by acceleration of speed and by the shocks as the rope takes up its load at every winding. The latter can be much mitigated in several ways, and appears to be satisfactorily provided for at the Warora and the Umaria Collieries, Central Provinces, by connecting the winding ropes to the cages by means of volute compression springs.

## Properties of steel wire and ropes—

The following statements are, in substance, the results of experience and of experiments made by authorities on the manufacture and properties of wire ropes, and of the materials from which they are made, and are well worth most careful study by all users of wire ropes, especially at mines where safety is of such paramount importance.

1. Considerations quite beyond external wear, such as internal friction, and the fatigue of steel wires from working over small pulleys requires that ropes which are to be employed for important purposes, and to be used over small pulleys, should be composed of numerous wires of small diameters, in order to obtain sufficient flexibility to withstand the severe bending stresses.

It may be noted that this internal friction in ropes and the fatigue brought on by working over small pulleys are apparently matters about which very little is known by rope users; or if known, most often forgotten or wilfully neglected, the result being that it does not receive the attention its importance deserves.

2. The value of frictional adhesion present in roping was exemplified by the fact that a splice of about 40 feet in length might exert a resistance equivalent to the ultimate strength of the rope. But for spliced ropes that have all the component wires and strands laid in the same direction, as is the case with ropes made on the Lang's lay principle, the length of the splices should be somewhat longer than those used for ordinary roping in which the wires and strands are laid in opposite directions.

3. As to working ropes over small pulleys, long experience has shown that there is a marked increase in the durability of the ropes as the sizes of the pulleys are increased, other things remaining the same; and that the cutting tendency produced by the longitudinal or axial movement of the component wires entered largely into the destruction of ropes so used. And a conclusion was arrived at that the destruction of ropes used over small pulleys was more due to internal cutting friction and fatigue of the steel than from any external wear.

This internal cutting action was found to be materially mitigated by the application of oil or other lubricants, when capable of permeating the rope, and when not of an acid or other deleterious character. For example, an unoiled rope 1¾ inch circumference ran over a 10½ inch pulley 16,000 times with a load equal to one-tenth of its breaking strain before there were any fractures or serious deterioration; but a similar piece of roping when oiled ran 38,700 times over the same pulley, and with the same load, before breaking.

And the better bearing surface afforded to the wires of running ropes when laid according to "Lang's system" was shown by the fact that with the same sized pulley, and working under similar conditions as above, an unoiled rope on "Lang's system" made 53,000 runs over the pulley before breaking; and an oiled portion 107,600 passes before breaking. Truly! the bad effects of internal actions in the rope itself, and the value of efficient oiling is hereby shown to be very great.

4. It is generally thought that the object of greasing is almost solely to prevent water getting into the rope, and in that way to avoid corrosion. But it is evident that the desirability of reducing internal friction and wear makes proper greasing to be a necessity even where there is little tendency to corrosion through permeated moisture. Some of the best rope-makers prefer hemp cores for their ropes, the preference being greatly due to the above-named internal friction and wear; and they saturate the material of the core when laying it in the rope by a suitable mixture of grease and plumbago; and it is claimed that this treatment of the core has a most beneficial effect on the life and efficiency of ropes so treated.

5. A strong opinion has been expressed that the failure of important ropes was frequently due to the smallness of the pulleys over which they had to work; and that experience has taught that in some cases, not at all unusual, three-fourths of the

ultimate strength of the ropes was taxed by the bending strain alone.

6. Experiments go to show that, generally, the life of a rope is twice as long when only bent in one direction as against those used under alternate stresses of flexure, as is the case with the "bottom rope" at a winding shaft where two ropes are used in the one shaft. It was also found that the properties of wires depreciated in this respect when made up into roping as bending efficiency tests proved that individual wires showed a far greater working life than when made up into ropes; and that indifferently manufactured ropes or those made with unsuitable machinery, where the torsional and bending influence, etc., are disregarded, may show a much larger divergence.

7. It was found in some particular cases that the strength of the component wires individually considered was about 10 per cent. *above* that obtained when in the form of roping. The variation in the strengths of pieces of plain wire was ascertained to be about 8 per cent., while galvanized wire showed a fluctuation of only 3 per cent.; but in torsional efficiency the former withstood an average of 90 twists in 8 inches of length, whilst the latter attained an average of 60 turns, and no appreciable difference was detected whether the twists were effected slowly or with considerable rapidity. The loss of ductility in annealed galvanized wire was very pronounced, whilst an increment in such property was exhibited in the case of annealed plain wire, *e.g.*, a galvanized wire withstood 57 twists against 178 twists in the plain condition. The loss of tensile strength due to annealing was found to be about constant in both cases.

8. It was also found that if a length of wire rope was soldered or secured at its ends the rigidity of the specimen was greatly augmented, and that the resistance might approach that of a solid bar. It is clearly deceptive to submit to customers, for testing, samples of flexible ropes which have been secured at their ends by rings or other binding devices; yet this is the form in which samples are often submitted.

9. The fact mentioned at the end of paragraph 7, that annealing causes a loss of tensile strength should be carefully considered, because a proper realization of its full meaning will put buyers on their guard against misapprehension and deception in matters relating to the strengths of ropes. If tensile strength was the only good quality required of a rope, the figures for any given rope could generally be made very high by simply making the wires hard; but the increase in tensile strength would be gained at the expense and loss of the other good properties of ductility and the power of withstanding twists and torsional strains without injury. Therefore, buyers should not be led away by high tensile qualities alone, but should require the other two qualities to be equally well represented in any ropes they buy.

10. In addition to the visible deterioration brought on by the uses and treatment a rope receives, there is the diminishing flexibility and elasticity, the wires becoming less fibrous and more crystalline and brittle. Not only is the old saying true that the strength of the whole is represented by the strength of the

weakest part, but another notable feature that should be kept in mind is, that the stretching of rods, chains, bolts, etc., when subjected to tensional strain, is not uniform unless the substance or strength of the article is uniform. The greatest extension takes place at the weakest point, so that a part that is at first a little weaker than the other parts has its comparative strength still further reduced by being stretched more than the stronger parts. This is a great disadvantage, and may be deceptive and lead to danger if it is not kept in mind and provided for where necessary, because such things frequently break with less force, tear and wear, than would be inferred if this fact was neglected.

## Enginemen.—

Another matter bearing a close relationship to the above is that of the winding enginemen where persons regularly ride down and up the shafts. It appears there is much difference of opinion as to what should be the youngest age of enginemen. The following particulars are given as a contribution to the facts appertaining to the present pratices in India.

*Enginemen.*

| | Name of mine or colliery. | Winding Enginemen. | | Remarks. |
|---|---|---|---|---|
| | | Reputed ages. | Ages at which they would be employed. | |
| | 1 | 2 | 3 | 4 |
| 1 | Serampore Colliery . | 21 to 50 | ... | Trained at the colliery. The youngest at present winding men is 35 years of age. |
| 2 | Kurhurbaree „ . | 21 to 50 | ... | |
| 3 | Raniganj Coal Association Giridih Mine. | ... | Under 18 | Have had general experience of firing and working of boilers before being employed as enginemen. |
| 4 | Mooduncotta . . . | ... | 18 | All are required to be well experienced. |
| 5 | Mudhabpur Colliery . | 25 to 40 | ... | Experienced men. |
| 6 | Nimcha . . . | ... | 25 | |
| 7 | Laikdee . . . | 28 to 40 | ... | |
| 8 | Sodepore . . . | Average 35 | ... | |
| 9 | Sanctoria . . . | 25 to 45 | ... | |
| 10 | Kuldiah (Bengal Coal Company.) | 35 | ... | |
| 11 | Desherghar . . . | 20 | .. | Trained at the colliery. |
| 12 | Borrea . . . . | 24 | ... | Ditto ditto. |
| 13 | Belrooi . . . . | ... | 20 | Ditto ditto. |
| 14 | Dhadka Colliery . . | 25 | ... | Must have had experience. |
| 15 | Kendua . . . | 21 | ... | Trained at the colliery. |
| 16 | Searsole . . . | 30 | | Ditto ditto. |
| 17 | Charanpur . . . | ... | 20 | Ditto ditto. |
| 18 | Singaren Valley Coal Concern. | 20 to 35 | ... | |
| 19 | Damuda Coal Company . | 20 | ... | |
| 20 | Luchipore . . . | 20 | No minimum | |
| 21 | Baraboni . . . | ... | ... | Has had 10 years' experience. |
| 22 | Sibpur . . . . | ... | 21 | |
| 23 | Roghunath Chak . . | ... | "Middle Aged" | |
| 24 | Bamandiah . . . | 16 | ... | |
| 25 | Bayra . . . . | 30 | ... | |

| | Name of mine or colliery. | Winding Enginemen. | | Remarks. |
|---|---|---|---|---|
| | | Reputed ages. | Ages at which they would be employed. | |
| | 1 | 2 | 3 | 4 |
| 26 | Warora . . . . | 30 | ... | |
| 27 | Mohpani Coal Association | Not given. Men of experience and of full age only employed. | | |
| 28 | Umaria Colliery . . | 25 to 37 | ... | |
| 29 | Singareni . . . | Work up from ash-boys. 25 to 40 | ... | Mostly men trained at the colliery, beginning as bolier firemen. |
| 30 | Gold Fields of Mysore Mines. | ... | Not younger than 18. | Trained. |
| 31 | Nine Reefs Mine . . | Only trained | ... | |
| 32 | Balaghat „ . . | Must be experienced. | | |
| 33 | Coromandel Gold Mine . | 25 to 50 | Must be qualified as enginemen. | |
| 34 | Tank Mine . . . | 22 to 40 | ... | |
| 35 | Nundydroog Mine . . | ... | ... | Trained. |
| 36 | Oorgaum . . . | ... | Supervised by an European when winding men. | Trained. |
| 37 | Champion Reef . . | ... | 18 | Must be trained. |
| 38 | Mysore Mine . . | Not less than about 25. | ... | Must have learned at the mine or brought a certificate from experienced engineer. |
| 39 | South East Mysore Mine | Not less than 20. | ... | |
| 40 | Mysore Reef . . | Ditto | ... | |
| 41 | Honnali . . . | ... | Not less than 18 | Trained. |
| 42 | Kempinkote . . | ... | Not less than 22 | Experienced. |

**Summary.**

42 Mines.

Actually employed.

| | | | | |
|---|---|---|---|---|
| 1 | mine employs at | 16 | | yrs. |
| 5 | „ | „ | 20 | „ |
| 1 | „ | „ | 20 to 35 | „ |
| 1 | „ | „ | 21 | „ |
| 2 | „ | „ | 21 to 50 | „ |
| 1 | „ | „ | 22 to 40 | „ |
| 1 | „ | „ | 24 | „ |
| 2 | „ | „ | 25 | „ |
| 1 | „ | „ | 25 to 37 | „ |
| 2 | „ | „ | 25 to 40 | „ |
| 1 | „ | „ | 25 to 45 | „ |
| 1 | „ | „ | 25 to 50 | „ |
| 1 | „ | „ | 28 to 40 | „ |
| 3 | „ | „ | 30 | „ |
| 2 | „ | „ | 35 | „ |
| 25 | | | | |

Ages at which they would be employed.

| | | | | |
|---|---|---|---|---|
| 5 | mines would employ at | 18 | | yrs. |
| 2 | „ | „ | 20 | „ |
| 1 | „ | „ | 21 | „ |
| 1 | „ | „ | 22 | „ |
| 1 | „ | „ | 25 | „ |
| 10 | | | | |

7 mines have not given any age.

42 Total.

## An example of a rope Inspector's report.

*Note.*—This form, filled in, generally formed a quarterly report by the Engineer after a careful examination of each rope throughout.

### ADVANCE COLLIERY COMPANY LIMITED.

### INSPECTOR'S REPORT ON WINDING ROPES (ROUND).

*Hollinwood,*.....*189* .

*Mr.*.....

*Sir,*

*I beg to inform you that on the*.....*of*.....
*I made a Special Examination of the*.....*winding rope at*.....
.....*Pit and so far as is visible it is in the condition stated herein. Subjoined are my general remarks and recommendations thereon.*

*I remain,*
*Dear Sir, yours truly,*
*Inspector*.....

---

Date when rope was put on

Maker's name

Size of rope

Length of rope

Number of wires in section of rope

Depth of pit, landing to landing plates

Weight wound, including cage, chains, rope, coal, and boxes

Diameter of head gear pulley

Diameter of drum (bare)

Number of laps on drum when cage is at bottom

State of rope which does not leave drum

State of rope in rope hole of drum

State of decking length

Wear of ropes

Greatest number of broken wires in one revolution

Greatest number of broken wires across rope

Greatest number of broken wires in any two feet of rope

| No. of Broken Wires in Circles. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Total No. of Broken Wires

Greatest number of Broken Wires together

Breaking Strain of Rope, as per maker's list

GENERAL REMARKS AND RECOMMENDATIONS.

## ADVANCE COLLIERY COMPANY, LIMITED.

*Inspector's Report on Winding Ropes (Flat.)*

*Hollinwood,*.....*189* .

*Mr.*.....

*Sir,*

*I beg to inform you that on the*.....*of*.....

*I made a Special Examination of the*.....*winding rope at*.....*Pit and so far as is visible it is in the condition stated herein. Subjoined are my general remarks and recommendations hereon.*

*I remain,*

*Dear Sir, yours truly,*

*Inspector*.....

---

Date when rope was put on

Maker's name

Size of rope

Length of rope

Number of wires in rope

Depth of pit, landing to landing plates

Weight wound, including cage, chains, rope, coal, and boxes

Diameter of head gear pulley

Diameter of vertical (bare)

No. of laps on vertical when cage is at bottom

Play between porcupines and ropes;_____at bottom lap,_____at top lap

State of rope which does not leave drum

State of rope in rope hole of vertical

State of decking length

State of stitches

Wear of ropes

Greatest number of broken wires in one layer of rope

Greatest number of broken wires across rope

Greatest number of broken wires in any two feet of rope

| | Broken Wires in Strands. | | | | | | | Broken Wires in Strands. | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. 1. | No. 2. | No. 3. | No. 4. | No. 5. | No. 6. | | No. 1. | No. 2. | No. 3. | No. 4. | No. 5. | No. 6. |
| Lap No. 1 | | | | | | | Lap No. 23 | | | | | | |
| „ „ 2 | | | | | | | „ „ 24 | | | | | | |
| „ „ 3 | | | | | | | „ „ 25 | | | | | | |
| „ „ 4 | | | | | | | „ „ 26 | | | | | | |
| „ „ 5 | | | | | | | „ „ 27 | | | | | | |
| „ „ 6 | | | | | | | „ „ 28 | | | | | | |
| „ „ 7 | | | | | | | „ „ 29 | | | | | | |
| „ „ 8 | | | | | | | „ „ 30 | | | | | | |
| „ „ 9 | | | | | | | „ „ 31 | | | | | | |
| „ „ 10 | | | | | | | „ „ 32 | | | | | | |
| „ „ 11 | | | | | | | „ „ 33 | | | | | | |
| „ „ 12 | | | | | | | „ „ 34 | | | | | | |
| „ „ 13 | | | | | | | „ „ 35 | | | | | | |
| „ „ 14 | | | | | | | „ „ 36 | | | | | | |
| „ „ 15 | | | | | | | „ „ 37 | | | | | | |
| „ „ 16 | | | | | | | „ „ 38 | | | | | | |
| „ „ 17 | | | | | | | „ „ 39 | | | | | | |
| „ „ 18 | | | | | | | „ „ 40 | | | | | | |
| „ „ 19 | | | | | | | „ „ 41 | | | | | | |
| „ „ 20 | | | | | | | „ „ 42 | | | | | | |
| „ „ 21 | | | | | | | „ „ 43 | | | | | | |
| „ „ 22 | | | | | | | „ „ 44 | | | | | | |

## SUMMARY OF BROKEN WIRES.

No. 1 Strand..... wires.
No. 2 „ ..... „
No. 3 „ ..... „
No. 4 „ ..... „
No. 5 „ ..... „
No. 6 „ ..... „

TOTAL.....wires.

Breaking strain of rope per maker's list

Number 1 strand is next the engine in every case.

## GENERAL REMARKS AND RECOMMENDATIONS.

## 28.—MINE INSPECTIONS AND REPORTS.

### Inspections and Reports by mine officials, or by competent persons appointed for the purpose.

Inspections and reports are a means provided for in Mines Acts for securing the safety of mines. Much benefit and means of safety may be got from a good and regular system of honest inspections. The inspections are the means of ascertaining regularly the actual state and condition of the mine; and the reports are the regular records of its condition, and ought also to be a record of any defects or dangers found when inspecting, as well as giving a brief statement of the course taken to keep the workmen from danger and to remedy the defects. A great point is to have regular honest inspections made by competent persons, and a true report or record made of the result of *every* inspection as soon as possible after the inspection is completed. The position of making such inspections is a very responsible one, especially if the duties are not properly performed; but this work should be done, if possible, by persons who realize their responsibility and the extent to which the safety of the workmen and of the mine depends on the inspections and all belonging to inspection work being thoroughly well done. Some mine managers in India, at "European mines," have regularly kept up a system of inspections, and a fewer number have caused regular reports of inspections to be made; but any future requirements for regular and definite inspections made for definite purposes at approximately fixed times, and with regular written reports or records of such inspections, will be to a great extent new. New things often puzzle old minds, and such a puzzled feeling has already been shown and expressed at many mines and information asked for. I, therefore, offer the following examples of how reports may well be made, as well as of suitable report books for the purpose of each kind of report.

### Sample forms of mine reports.

Notes on the following sample forms of reports, etc.—

1. A variety of forms are given to suit all tastes and conditions. Some require very little daily writing: these are to meet the cases where any writing will be a difficulty. Some contain very little printed matter to meet the case of those who wish for cheap books, or object to much printing.
2. The reports might be written in books without any printed matter whatever, some of these forms of arrangement being adapted for such books.
3. Or the full headings, with perhaps a copy of the rule that is applicable, might be written or printed on the first page only of each report book; and only the column headings put on the top of each of the other pages of the report book.
4. An alternative would be to have separate report books for above ground reports, and for below ground reports.
5. Also separate books for reports of inspections before the commencement of shifts, or at change of shifts, where firedamp has been recently found.

6. On the other hand, one book only could very well be made to do service for all and every report at the mine, if the circumstances are favourable.

7. But the official who appoints the competent persons to make the inspections and the reports should make a record of the appointment at the beginning of the report book; the record to include the name, date of appointment, parts of the mine he is appointed for, and rules in compliance with which the appointment is made.

8. The wording of the books and of the reports should be in the languages most suited to the mine and the people.

9. The sizes of the books should be so arranged that a book of one kind can be filled in about one year, that being about as long as such a book can be kept in good condition when in regular use at a mine.

10. If there should be a fair demand for such books, it should be possible to arrange with some good Indian printers to supply them at a moderate cost.

11. It will be an advantage to begin with a good system of inspecting and reports, and have the system rigorously carried out, and with equal completeness even when the enthusiasm due to its newness has passed away. The present reports made at Indian mines often bear indications of there being no supervising official influence on the reports or the reporters, for they are not often in a satisfactory form or satisfactorily made.

12. The examples are intended to be suggestive only, and may be of assistance to those who have hitherto had no experience of reporting, as well as being of some assistance in understanding what may be required by rules formulated to meet requirements for inspections and reports.

In addition to samples of what may be termed ordinary forms of reports, I have given samples of special, but very useful, forms of reports and notices and records.

## SUGGESTIVE SAMPLES OF MINE REPORTS.

NOTE.—The inspections should be made with a locked safety lamp where firedamp has been recently found.

### 1*a*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of the shafts or pits)—**No. 2 pit workings.**

Report to be made for every daily examination. General Rule . Everything that is likely to affect the safety of the workmen or of every part of the mine in which any person has to work or pass.

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We, whose signatures are hereto attached, do separately and individually, and each for the district and date against which his name stands, certify that we examined every part of the mine as required, and truly report on their condition.

| Date. | Time. | District or part examined. | Condition of mine. |
|---|---|---|---|
| 1896. | | | |
| 5th March . | 5 A.M. to 6-30 A.M. | All the workings south of No. 2 pit. | I found all parts and everything in a good and safe condition.<br>BHARI LAL,<br>*Sirdar.* |
| 5th March . | 6 A.M. to 7 A.M. | All the workings north of No. 2 pit. | I found all parts and everything safe in every respect, except a small quantity of firedamp in a hole in the roof at 20 feet from the face of Khetter Mohun's working place, No. 8, on the rise. I immediately cleared away the gas by directing air into the hole by means of sheeting I fixed and left there.<br>BHAGHWAN SINGH,<br>*Sirdar.* |
| 5th March . | 4 P.M. . | No. 2, south workings. | I found dangerous roof on the main level from the shaft, and arranged for the part being made safe and the workmen kept from danger. I found all other parts to be safe and in good condition, and the ventilation good.<br>ALI BUX,<br>*Sirdar.* |

NOTE.—The inspections should be made with a locked safety lamp where firedamp has been recently found.

## 1*b*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of shafts, pits, or seams)—**No. 2 pit workings.**

We, the undersigned, being the persons appointed under General Rule , hereby declare that we have each and separately inspected the mine or part to which our reports are attached, and on the following dates found the condition of the mine to be as stated:—

| Date. | Time. | District or part examined. | Condition of mine. |
|---|---|---|---|
| 1896. | | | |
| 5th March . | 5 A.M. to 6-30 A.M. | All the workings south of No. 2 pit. | I found all parts, and everything in a good and safe condition.<br>BHARI LAL,<br>*Sirdar.* |
| 5th March . | 6 A.M. to 7 A.M. | All the workings north of No. 2 pit. | I found all parts and everything safe in every respect, except a small quantity of firedamp in a hole in the roof at 20 feet from the face of Khetter Mohun's working place, No. 8, on the rise. I immediately cleared away the gas by directing air into the hole by means of sheeting I fixed and left there.<br>BHAGHWAN SINGH,<br>*Sirdar.* |
| 5th March . | 4 P.M. | No. 2 south workings. | I found dangerous roof on the main level from the shaft, and arranged for the part being made safe and the workmen kept from the danger. I found all other parts to be safe and in good condition, and the ventilation good.<br>ALI BUX,<br>*Sirdar.* |

NOTE.—The inspections should be made with a locked safety lamp where firedamp has been recently found.

## 1*c*. THE INDIAN MINES ACT 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of the shafts or pits).—**No. 2 pit workings.**

Report to be made for every daily examination.

General Rule . Every part of the mine.

| Date. | Time. | District or part examined. | Condition of mine. |
|---|---|---|---|
| 1896. | | | |
| 5th March . | 5 A.M. to 6-30 A.M. | All the workings south of No. 2 pit. | I found all parts and everything in a good and safe condition.<br>BHARI LAL,<br>*Sirdar.* |
| 5th March . | 6 A.M. to 7 A.M. | All the workings north of No. 2 pit. | I found all parts and everything safe in every respect, except a small quantity of firedamp in a hole in the roof at 20 feet from the face of Khetter Mohun's working place, No. 8 on the rise. I immediately cleared away the gas by diretcing air into the hole by means of sheeting I fixed and left there.<br>BHAGHWAN SINGH,<br>*Sirdar.* |
| 5th March . | 4 P.M. . | No. 2 south workings. | I found dangerous roof on the main level from the shaft, and arranged for the part being made safe and the workmen kept from the danger. I found all other parts to be safe and in good condition, and the ventilation good.<br>ALI BUX,<br>*Sirdar.* |

NOTE.—The inspections should be made with a locked safety lamp where firedamp has been recently found.

## 1*d*. REPORTS REQUIRED BY GENERAL RULE EVERYTHING AFFECTING SAFETY (EXCLUSIVE OF MACHINERY).

Name of mine—**Pioneer.**
Part of the mine to which the reports apply. } **All parts of No. 2 pit workings.**

| No. of report. | Reports on the mine. | Signature, and official position. |
|---|---|---|
| 1. | I have this morning examined all the roads and workings south of No. 2 pit, and found all parts and everything in a good and safe condition. | 6-30 A.M. BHARI LAL, *Sirdar.* |
| 2. | I have just finished the examination of all the roads and workings north of No. 2 pit, and have found all parts and everything safe in every respect, except that there was a small quantity of firedamp in a hole in the roof at 20 feet from the face of Khetter Mohun's working place, No. 8, on the rise. I immediately cleared away the gas by directing air into the hole by means of sheeting I fixed and left there. | 7 A.M. BHAGHWAN SINGH, *Sirdar.* |
| 3. | On the inspection of No. 2 south workings I found dangerous roof on the main level from the shaft, and arranged for the part being made safe and the workmen kept from the danger. I found all other parts to be safe and in good condition, and the ventilation good. | 4 P. M. ALI BUX, *Sirdar.* |

NOTE.—The inspections should be made with a locked safety lamp where firedamp has been recently found.

1*e*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Whether the whole mine, or name of the part examined.—**All the workings south of No. 2 pit.**

Report for every daily examination, General Rule

As to the presence of gas.—**None found.**

State of the ventilation.—**Good.**

State of roof and sides.—**All safe and secure.**

All other things affecting safety.—**Everything in good and safe condition.**

Dated this **5th** day of **March** 1896, at **6-30** o'clock in the **morning.**

Signed.—**BHARI LAL,**
***Sirdar.***

REPORT.

Whether the whole mine, or name of the part examined.—**All the workings north of No. 2 shaft.**

As to the presence of gas.—**I found explosive gas extending for about 12 feet from the working face of Abdul Faiz, No. 23 rise working, I fenced off the whole width of the entrance to the place. It appears to be due to a blower that I could hear.**

State of the ventilation.—**The ventilation was good everywhere except in No. 23 rise working.**

State of roof and sides.—**I found the coal side unsafe at the south lower corner of No. 23 landing. I at once instructed the mistris to get some of the loose coal pulled down and secure the other parts with timber.**

All other things affecting safety.—**The ventilating sheet at the bottom of No. 9 road is torn and requires repairs. And there is a misfired shot in Gora Chand's No. 5 working. Everything else is safe.**

Dated this **5th** day of **March** 1896, at 7 o'clock in the **morning.**

Signed.—**BHAGWAN SINGH,**
***Sirdar.***

NOTE.—The inspections should be made with a locked safety lamp where firedamp has recently been, or is likely to be found.

## 1*f*. THE INDIAN MINES ACT 189 .

Reports required by the General Rules .

Subject of reports. { 1. Safety of all parts of the mine. 2. All machinery. 3. Shafts and outlets.

Name of mine.—**Pioneer.**

| Date | Time. | Parts of the mine to which the reports apply. | Subject of each report. | Results of inspections. | Signature, and official position. |
|---|---|---|---|---|---|
| 1895 5th March. | 5 to 6-30 A.M. | No. 2 pit, south workings. | Safety of all parts of the mine. | I found all parts and everything in a good and safe condition. | BARIH LAL, *Sirdar.* |
| 5th March. | 2 P.M. | No. 2 pit below ground. | All machinery. | Found all machinery in good and safe condition. | PRAG SING, *Mistri.* |
| 5th March. | 2 P.M. | No. 2 pit above ground. | All machinery, and winding ropes. | Found 6 broken wires, each some distance apart in the south winding rope; and the steam gauge on No. 1 boiler appears to be out of order. Everything else was in good condition. | GONESH NATH, *Mistri.* |
| 5th March. | 12 Noon. | No. 1 and 2 pits. | Shafts and outlets. | I have carefully examined the shafts and found them to be in good and safe condition. | LUCHMAN RAM, *Assistant to Overman.* |

NOTE.—This form is adapted for all three kinds of reports being made on one page.—J. G.

2*a*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of shafts, pits, or seams)—**All machinery at No. 2 pit.**

We, the undersigned, being the persons appointed under General Rule , hereby declare that we have each and separately inspected all the machinery in the mine or part to which our reports are attached, and on the following dates found the condition to be as reported :—

| Date. | Time. | District or part examined. | Condition of machinery. |
|---|---|---|---|
| 1896. | | | |
| 5th March . | 3 P.M. . . | All parts below ground. | All in good order and safe except that the hauling rope capping is becoming defective.<br><br>PRAG SINGH,<br>*Mistri.* |
| 5th March . | 2 P.M. . . | All machinery above ground. | I have examined the machinery and the winding ropes and found everything in good condition and safe. The winding ropes have this morning been cleaned and greased, and the south rope re-capped.<br><br>GONESH NATH,<br>*Mistri.* |

*2b.* THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of the shafts or pits)—**No. 1 or Marwari section.**

Report required to be made daily. General Rule .

ALL MACHINERY.

We, whose signatures are hereto attached, do separately and individually, and each for the district, and date against which his name stands, certify that we examined all the machinery, and truly report on its condition.

| Date. | Time. | District or part examined. | Condition of machinery. |
|---|---|---|---|
| 1896. | | | |
| 6th March . | 2 P.M. . . | All the machinery above and below ground. | I have examined all the machinery and found everything good and safe in every respect, except that water is leaking at the fusible plug of No. 3 boiler.<br><br>ABDUL ROHOMAN,<br>*Mistri.* |
| 7th March . | 2 P.M. . . | All the Machinery above and below ground. | I have examined all the machinery and found everything good and safe in every respect. No. 3 boiler has been run off for cleaning and examination.<br><br>ABUDL ROHOMAN,<br>*Mistri.* |

2*c*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of the shafts or pits).—**No. 1 or Marwari section.**

Report required to be made daily. General Rule .

ALL MACHINERY.

| Date. | Time. | District, or part examined. | Condition of machinery. |
|---|---|---|---|
| 1896. | | | |
| 6th March. | 2 P.M. | All the machinery below ground. | I have examined all the machinery and found it safe.<br>PRAG SINGH,<br>*Mistri.* |
| 6th March. | 2 P.M. | All machinery above ground. | I have examined all the machinery, engines, boilers, winding ropes, headgear and pulleys, and find them to be in good working order and safe condition.<br>ABDUL ROHOMAN,<br>*Mistri.* |

## *2d.* REPORTS REQUIRED BY GENERAL RULE

### MACHINERY.

Name of mine—**Pioneer.**

Part of mine to which these reports apply.—**All parts of the mine.**

| No. of report. | Reports on the machinery. | Signature, and official position. |
|---|---|---|
| 1 | I, being the person appointed for the purpose, have examined all the machinery, ropes, chains, etc., at this mine, and find them to be in proper working order and good and safe condition in every respect.<br><br>6th March, 2 P.M. | ABDUL ROHOMAN, *Mistri.* |

2e. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Parts inspected aboveground—**All parts.**

MACHINERY ABOVE GROUND.

$\frac{I}{We}$, the undersigned, being the persons appointed for that purpose, as required by General Rule , hereby declare that $\frac{I}{we}$ have carefully examined the state of all ropes, chains, guides, and all other machinery in use in the abovenamed parts of the mine, and that $\frac{I}{we}$ find them to be in the condition hereinafter stated, namely :—

**I found the winding ropes and chains to be in a good and safe condition.**

ABDUL ROHOMAN,

*Mistri.*

**I have found all the machinery to be in good condition and safe in every respect.**

LALIF ROHOMAN,

*Mistri.*

Dated this 6th day of **March** 1896.

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Parts inspected below ground.—**All parts.**

MACHINERY BELOW GROUND.

**I**, the undersigned, being the person appointed for that purpose, as required by General Rule , hereby declare that **I** have carefully examined the state of all ropes, chains, guides, and all other machinery in use in the abovenamed parts of the mine, and that **I** find them to be in the condition hereinafter stated, namely :—

**The stopblock at the top of No. 1 incline is broken, and the brake timbers of the incline wheel are worn down to the bolt heads. The diphole is becoming silted up so as to partly support the cage-guide rods weights. All other things are in good condition.**

BAHAR ALI,

*Makadum.*

Dated this 6th day of **March** 1896.

*2f.* THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

ALL THE MACHINERY ABOVE GROUND.

The undersigned, being the person appointed for that purpose, as required by General Rule , hereby declares that having carefully examined the state of all ropes, chains, and all other machinery in use above ground at the mine, he found them to be in the condition hereinafter stated opposite the date of inspection, namely :—

| Date. | Time of inspection. | Condition in which found. | Signature, and official position. |
|---|---|---|---|
| 1896. 6th March . | 8 A.M. to 2 P.M. | All good and safe . . | LALIF ROHOMAN, *Mistri.* |

29. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

ALL THE MACHINERY BELOW GROUND.

The undersigned, being the person appointed for that purpose, as required by General Rule , hereby declares that having carefully examined the state of all ropes, chains, and all other machinery in use below grourd at the mine, he found them to be in the condition hereinafter stated opposite the date of inspection, namely:—

| Date. | Time of inspection. | Condition in which found. | Signature, and official position. |
|---|---|---|---|
| 1896. | | | |
| 6th March . | 6 A.M. to 2 P.M. | All in good condition and safe. | BAHAR ALI, *Makadum.* |

## 3*a*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine, (or name, or number of the shafts, or pits).—**Nos. 1 and 2 shafts, and Kalachand incline.**

Report to be made at least once in every week. General Rule . Everything affecting the safety of every shaft or outlet that is used for the passage of any workmen into and out of the mine.

We whose signatures are hereto attached, do separately and individually, and each for the district and date against which his name stands, certify that we examined the shafts or outlets as required, and truly report on their condition.

| Date. | Time. | District, or part examined. | Condition of shafts and outlets. |
|---|---|---|---|
| 1896. | | | |
| 6th March . | 4 P.M. . . | No. 1 shaft . . | Examined and found to be safe in every respect.<br>GOUR NATH,<br>*Overman.* |
| 6th March . | 4 P.M. . . | No. 2 shaft, and Kalachand incline. | Examined and found the shaft and incline in secure and safe condition.<br>DURGA PURSAD,<br>*Overman.* |

## 3*b*. THE INDIAN MINES ACT, 189 .

Name of the mine—**Pioneer.**

SHAFTS AND OUTLETS.

The undersigned, being the person appointed for that purpose, as required by General Rule , hereby declares that having carefully examined the state of the shafts and outlets of the abovenamed mine, and used for the passage of workmen into and out of the mine, he found them to be in the condition hereinafter stated opposite the date of inspection, namely :—

| Date. | Time of inspection. | Condition in which found. | Signature, and official position. |
|---|---|---|---|
| 1896 | | | |
| 6th March . | 3 P.M. . . | Found No. 1 shaft to be quite safe. | GOUR NATH, *Overman.* |
| 6th March . | 3 P.M. . . | I. to-day, found No. 2 shaft and Kalachand incline to be secure and safe. | DURGA PURSAD, *Overman.* |

## 3*c*. THE INDIAN MINES ACT, 189

Name of mine.—**Pioneer.**

Section of mines, (or name, or number of shafts, pits, or seams).—**Nos. 1 and 2 shafts, and Kalachand incline.**

We, the undersigned, being the persons appointed under General Rule , hereby declare that we have each and separately inspected the shafts and outlets to which our reports are attached, and on the following dates found their condition to be as reported.

| Date. | Time. | District or part examined. | Condition of shafts and outlets. |
|---|---|---|---|
| 1896. | | | |
| 6th March . | 4 P.M. . . | No. 1 shaft . . | Examined and found to be in a sound and safe condition.<br>GOUR NATH,<br>*Overman.* |
| 6th March . | 4 P.M. . . | No. 2 shaft, and Kalachand incline. | In secure and safe condition.<br>DURGA PURSAD,<br>*Overman.* |

## 3*d*.—THE INDIAN MINES ACT, 189 .

Name of mine—Pioneer.

Section of mine, (or name, or number of the shafts, or pits).—Nos. 1 and 2 shafts, and Kalachand incline.

Report to be made at least once in every week. General Rule .

SHAFTS AND OUTLETS.

| Date. | Time. | District, or part examined. | Condition of shafts and outlets. |
|---|---|---|---|
| 1896. | | | |
| 6th March . | 3 P.M. . . | The 2 shafts and the incline. | In safe and secure condition.<br>DURGA PURSAD,<br>*Overman.* |
| 7th March . | 3 P.M. . . | Ditto . . . | On examining these I found that the roof in the incline at from 125 to 140 feet from surface had become insecure, I at once started the mistris to make it secure. All other parts were in safe condition.<br>DURGA PURSAD,<br>*Overman.* |

## 3e. REPORTS REQUIRED BY GENERAL RULE

### SHAFTS AND OUTLETS.

Name of mine.—**Pioneer.**

Part of mine to which these reports apply.—**All parts of the mine.**

| No. of report. | Reports on the shafts and outlets. | Signature and official position. |
|---|---|---|
| 1 | No. 1 shaft secure and safe . . . . . | GOUR NATH, *Overman.* 6th March 1896. |
| 2 | No. 2 shaft and Kalachand incline in good and safe condition. | DURGA PURSAD *Overman.* 6th March 1896. |
| 3 | No. 1 shaft safe in every respect . . . . . | GOUR NATH, *Overman.* 7th March 1896. |
| 4 | I have examined No. 2 shaft and Kalachand incline and find them to be safe. | DURGA PURSAD, *Overman.* 7th March 1896. |

*cf.* THE INDIAN MINES ACT, 189 .

Name of mine.—**Pioneer.**

Sections of the mine examined.—**Nos. 1 and 2 shafts and Kalachand incline.**

SHAFTS AND OUTLETS.

I, the undersigned, being the person appointed for that purpose as required by General Rule , hereby declare that I have carefully examined the state of the shafts and outlets that are used for the passage of workmen into and out of the abovenamed sections of the mine, and that I find them to be in the condition hereinafter stated, namely :—

**In secure and safe condition.**

GOUR NATH,
*Overman.*

Dated this **6th** day **March** 1896.

---

Section of the mine examined.—**Nos. 1 and 2 shafts and Kalachand incline.**

SHAFTS AND OUTLETS.

We, the undersigned, being the persons appointed for that purpose as required by General Rule , hereby declare that we have carefully examined the state of the shafts and outlets that are used for the passage of workmen into and out of the abovenamed section of the mine, and that we find them to be in the condition hereinafter stated, namely :—

**No. 1 shaft found to be secure and safe.**

GOUR NATH,
*Overman.*

**No. 2 shaft and Kalachand incline found to be safe in every respect.**

DURGA PURSAD,
*Overman.*

Dated this **6th** day of **March** 1896.

NOTE.—The inspections should be made with a locked safety lamp where firedamp is likely to be found.

## 4*a*. THE INDIAN MINES ACT, 189 . .

Name of mine—**Pioneer.**

Section of mine (or number of shafts, pits, or seams)—**No. 2 shaft workings, No. 1 seam.**

### SUDDEN DANGER.

We, the undersigned, being the persons appointed for the purpose under General Rule , hereby declare that we each, and separately, inspected the parts found to be dangerous and reported on by each, and at the times, and on the dates given, and found their condition to be as stated.

| Date. | Time. | Particulars of place and of cause of danger. | Declaration of safety. |
|---|---|---|---|
| 1896. | | | |
| 20th June . | 8 A.M. . . | Having heard of danger, I at once inspected No. 4 rise workings and found firedamp, and withdrew all the workmen in that part at 7 A.M. The gas had accumulated owing to a fall of roof damaging an air-stopping. The 3rd road beyond the top cut-through was full of gas.<br><br>DURGA PURSAD,<br>*Overman.* | |
| 21st June . | 4 P.M. . . | ..... | I have just inspected the No. 4 rise workings and found all the firedamp removed, the air-stopping repaired, and the ventilation properly restored. It is now quite safe for the men to go into and work there in the night shift.<br><br>LUTCHMAN RAM,<br>*Assistant Manager.* |

NOTE.—The inspection should be made with a locked safety lamp where there is likely to be firedamp.

## 46. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of the shafts or outlets).—**No. 2 shaft workings, No. 1 seam.**

GENERAL RULE . ANY SUDDEN DANGER.

(*a*) Report on the condition of the place when the danger is found.

(*b*) Report on the condition of the place when the danger is removed.

| Date. | Time. | Place of danger. | Condition of place. |
|---|---|---|---|
| 1896. | | | |
| 20th June . | 8 A.M. . | No. 4 rise workings | The 3rd road beyond the top cut-through is full of fire-damp, and there is also some in each of two other places on each side of No. 3 road. All the workmen were withdrawn at 7 A.M. The cause of the gas accumulating was a fall of roof damaging an air-stopping.<br>DURGA PURSAD,<br>*Overman.* |
| 21st June . | 4 P.M. . | No. 4 rise workings | I now find and declare these places to be free from fire-damp and safe. The ventilation is restored, and the stopping made right, and workmen can now safely go to work in these places.<br>LUTCHMAN RAM,<br>*Assistant Manager.* |

NOTE.—The inspection should be made with a locked safety lamp where there is likely to be fire-damp.

## 4*c*. THE INDIAN MINES ACT, 189 .

Name of mine—**Pioneer.**

Section of mine (or name, or number of shafts, pits, or seams).—**No. 2 shaft workings, No. 1 seam.**

### SUDDEN DANGER.

We, the undersigned, being the persons appointed for the purpose, under General Rule , hereby declare that we, each and separately, inspected the parts found to be dangerous and reported on by each, and at the times, and on the dates given; and found their condition to be as stated.

| Date. | Time. | Place of danger. | Condition of place, cause of danger, and declaration of safety. |
|---|---|---|---|
| 1896. | | | |
| 20th June . | 8 A.M. . . | No. 4 rise workings | The 3rd road beyond the top cut-through is full of fire-damp, and there is a less quantity of gas in two other places on each side of No. 3 road. All the workmen were withdrawn at 7 A.M. The gas had accumulated owing to a fall of roof damaging an air-stopping.<br>DURGA PURSAD,<br>*Overman.* |
| 21st June . | 4 P M. . . | No. 4 rise workings | I have just inspected these workings and found all the fire-damp removed, the air-stopping repaired, and the ventilation properly restored. It is now quite safe for the men to go into and work there.<br>LUTCHMAN RAM,<br>*Assistant Manager.* |

NOTE.—The inspection should be made with a locked safety lamp where fire-damp is likely to be found.

## 4*d*. REPORTS REQUIRED BY GENERAL RULE
### SUDDEN DANGER.

| No. of report. | Reports with full particulars. | Signature and official position. |
|---|---|---|
| | NO. 2 SHAFT, 1 SEAM. | |
| 1. | Having heard of danger, I at once inspected No. 4 rise workings at 7 A.M., and finding there was fire-damp the workmen were withdrawn at once. The 3rd road beyond the top cut-through was full of fire-damp, and two other roads on each side of it contained some, and was caused by a fall of roof damaging an air-stopping. | DURGA PURSAD, *Overman.* 8 A.M., 20th June 1896. |
| 2. | Having inspected the No. 4 rise workings, I now declare them to be free from gas and safe in every respect. | LUTCHMAN RAM, *Asst. Manager.* 4 P.M., 21st June 1896. |

NOTE.—The inspections should be made with a locked safety lamp where fire-damp is likely to be id

4 *e*. THE INDIAN MINES ACT, 189 .

GENERAL RULE . SUDDEN DANGER.

Mine.—**Pioneer.**

Section of the mine.—**No. 2 shaft, No. 1 seam.**

Name of the person for the time being in charge of the section. } **Durga Pursad, Overman.**

Name of the person who inspected when the danger was found. } Ditto.

Part of the mine found to be dangerous.—**No. 4 rise workings.**

Cause and particulars of danger.—**Fire-damp. A fall of roof having damaged an air-stopping, the fire-damp accumulated in five working-places, the middle one, or No. 3 road, is full beyond the top cut-through.**

Time of discovery of the danger.—The **20th** day of **June** 1896, at **6-50** o'clock A.M.

Time of withdrawal of the workmen.—The **20th** day of **June** 1896, at **7** A.M.

I hereby report that I made the above inspection with a locked safety lamp, and that the foregoing particulars are correct.

Dated this **20th** day of **June** 1896, at **8** A.M.

(Sd.) **DURGA PURSAD,**

Official position.—***Overman.***

Having inspected all the parts of the mine stated above to be dangerous, I now declare that the cause of danger has been removed, and that the workmen may with safety re-enter the aforesaid parts of the mine.

Dated this **21st** day of **June** 1896, at **4** P.M.

(Sd.) **LUTCHMAN RAM,**

Official position.—***Assistant Manager.***

## 29.—SUNDRY FORMS.

## THE INDIAN MINES ACT, 189 .

*Record of air measurements, General Rule* .

1. Name of mine_____
2. Name of owner_____
3. Name of manager_____
4. Name, or number of pits_____
5. Name, or number of seam or vein_____

| 6. Year. 189 . | 8. Place of measurement. | 9. Mode of ventilation, and description of ventilating apparatus. | 10. Number of splits (ventilating districts, or separate and distinct air-currents). | 11. Quantity of air in each split. | 12. Average total quantity of air entering and leaving the mine. |
|---|---|---|---|---|---|
| 7. Date. | | | | Cubic feet per minute. | Cubic feet per minute. |
| | | | | | |

# THE INDIAN MINES ACT, 189 .

## GENERAL RULE .

*Monthly record of ventilation.*

Name of mine _____

Section of mine _____

Mode of ventilation, and description of means for producing the ventilation _____

Names, or numbers of downcast shafts _____

Diameters, or other dimensions _____

Depths _____

Names, or numbers of upcast shafts _____

Diameters, or other dimensions _____

Depths _____

| Date. 189 . | No. or names of ventilating districts or air-splits. | MEASURED QUANTITY OF AIR. | SECTIONAL AREA OF AIR-WAYS AT, OR NEAR PLACE OF MEASUREMENT. | GROSS TOTAL QUANTITY OF AIR AS ASCERTAINED BY A SINGLE MEASUREMENT, WHERE PRACTICABLE. | Signature, and position at the mine. |
|---|---|---|---|---|---|
| | | Cubic feet per minute. | Square feet. | Cubic feet per minute. | |
| | | | | | |

# THE INDIAN MINES ACT, 189 .

*Record of air measurements, General Rule* .

*1. NAME OF MINE.*——— *2. NAME OF OWNER.*——— 3. NAME OF MANAGER.———

| 4. YEAR. 189 . / 5. Date. | 6. Name or Numbers of pits. | 7. Name or No. of seam or vein. | 8. Place of measurement. | 9. Mode of ventilation, and description of ventilating apparatus. | PARTICULARS OF AIR SHAFTS. | | | | | | 12. Number of splits (ventilating districts, or separate and distinct air-currents). | 13. Quantity of air in each split. | 14. AIR-WAYS. | | 15. Average total quantity of air entering and leaving the mine. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 10. Downcasts. | | | 11. Upcasts. | | | | | Approximate length of air-ways in each split. | Minimum sectional area of each split. | |
| | | | | | Number of shafts. | Diameter or dimensions. | Depth. | Number of shafts. | Diameter or dimensions. | Depth. | | | | | |
| | | | | | | Feet. | Feet. | | Feet. | Feet. | | Cubic feet per minute. | Feet. | Sq. feet. | Cubic feet per minute. |
| | | | | | | | | | | | | | | | |

*Record of the total number of persons employed daily at the mine, or whether employed directly by the owner, or by contractors, or other persons.*

Name of mine_____

Name of owner_____

Name of manager_____

Names or numbers of the sections of the mine to which this record applies_____

Numbers employed.

| YEAR. 189 . | ABOVE GROUND. | | | | BELOW GROUND. | | | | TOTAL. | TOTAL. | TOTAL. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MALES. | | FEMALES. | | MALES. | | FEMALES. | | | | |
| Dates. | Over 12 years. | Under 12 years. | Over 12 years. | Under 12 years. | Over 12 years. | Under 12 years. | Over 12 years. | Under 12 years. | Above ground. | Below ground. | Above ground and below ground. |
| January 1 | | | | | | | | | | | |
| „ 2 | | | | | | | | | | | |
| „ 3 | | | | | | | | | | | |
| „ 4 | | | | | | | | | | | |
| „ 5 | | | | | | | | | | | |
| „ 6 | | | | | | | | | | | |
| „ 7 | | | | | | | | | | | |
| „ 8 | | | | | | | | | | | |
| „ 9 | | | | | | | | | | | |
| „ 10 | | | | | | | | | | | |
| „ 11 | | | | | | | | | | | |
| „ 12 | | | | | | | | | | | |
| „ 13 | | | | | | | | | | | |
| „ 14 | | | | | | | | | | | |
| „ 15 | | | | | | | | | | | |
| „ 16 | | | | | | | | | | | |
| „ 17 | | | | | | | | | | | |
| „ 18 | | | | | | | | | | | |
| „ 19 | | | | | | | | | | | |
| „ 20 | | | | | | | | | | | |
| „ 21 | | | | | | | | | | | |
| „ 22 | | | | | | | | | | | |
| „ 23 | | | | | | | | | | | |
| „ 24 | | | | | | | | | | | |
| „ 25 | | | | | | | | | | | |
| „ 26 | | | | | | | | | | | |
| „ 27 | | | | | | | | | | | |
| „ 28 | | | | | | | | | | | |
| „ 29 | | | | | | | | | | | |
| „ 30 | | | | | | | | | | | |
| „ 31 | | | | | | | | | | | |
| TOTALS . | | | | | | | | | | | |

The following are other *suggestive* forms for reports.

## Example of Overman's report, or of Sardar, Makadum, or other person filling a similar position at the mine.

1. Name of mine_____

_____

2. Section of the mine_____

_____

3. Parts of the mine inspected_____

_____

4. Condition in which the several parts were found_____

_____

5. Name, and state of air-ways, or main travelling-ways inspected_____

_____

6. What defects are being remedied, and present condition_____

_____

7. Give particulars of any personal accident_____

_____

8. Give particulars of any accident to the mine, of any contravention or any unusual occurrence_____

_____

9. Particulars of anything wanted for safety, or for the working of the mine, but not supplied_____

_____

10. Brief resumé of recorded reports_____

_____

11. General observations_____

_____

12. Signature, official position, and date_____

## A suggestion for a Monthly report, to be made by the Assistant Manager, or other person in charge of the mine.

Name of mine_____

Owner or Company_____

Name of manager_____

Situation of mine_____

To the Manager,

_____.

Sir,

I have the honour to submit a report on the following matters. It is based on my inspections and the matters that have come under my notice during the month past:—

1. Machinery_____
2. Shafts_____
3. Levels, and other such roads_____
4. Inclined planes_____
5. Intake air-ways_____
6. Return air-ways_____
7. Working places_____
8. Old workings_____
9. Ventilation_____
10. Ventilating apparatus_____
11. Accidents_____
12. The employés_____
13. Out-put_____
14. Supplies_____
15. General observations_____

Dated this_____day of_____189 ._____

Signature, and official position_____

# FORMS OF APPOINTMENT.

THE INDIAN MINES ACT, 189 .

No._____ 189 .

_____ Mine.

_____ Pit.

_____ Seam.

_____ District.

Appointment of _____,

employed as _____

to make inspections under General Rule

Initials of official issuing this certificate. } _____

Date when certificate was cancelled or withdrawn.

THE INDIAN MINES ACT, 189 .

Appointment as a competent person to make examinations.

No._____

_____ Mine.

Date _____

Name _____, employed as _____,

is hereby appointed as a competent person to make the examinations of all the ( mine, machinery, shafts and outlets ) as required by General Rule , in the ( pit, district, section, seam, ) of this mine; and also to report on the parts examined, in accordance with the General and Special Rules in force.

Signed _____

Official position _____

# FORMS OF APPOINTMENT.

## THE INDIAN MINES ACT, 189 .

*Duplicate of Certificate.*

Certificate No._____

Mine_____

Section of mine_____

Date_____

Appointment of_____

Employed as_____

to make examinations of_____

Received this_____day of_____189 , the counterpart of this certificate; and also a copy of the rules.

Signed._____

Employment._____

Name, and position of the official making the appointment. } _____

Name, and position of the person presenting the certificate and rules to person appointed. } _____

## THE INDIAN MINES ACT, 189 .

Certificate of appointment to make the examinations required by the General Rules.

No._____

Mine_____

Section of mine_____

Date_____

I hereby appoint_____, employed as_____,

to make at least one examination (daily, during each shift within / 2 hours before each shift, weekly,) of all (the mine, district or section, / machinery, shafts and outlets)

_____and also to make the report required by the_____General Rule.

Signature, and position of official issuing the certificate. } _____

Signature, and position of person presenting the certificate. } _____

I hereby accept the above appointment, and its responsibilities; and also acknowledge the receipt of a copy of the rules.

Signed_____

## FORMS OF AUTHORIZATION.

THE INDIAN MINES ACT, 189 .

*Duplicate of Certificate.*

Certificate No._____

Mine_____

Section of mine_____

Date_____

Authority to_____ aged , and at present employed as_____, to possess a key or other contrivance for opening the lock of a safety lamp.

Received this_____ day of_____ 189 , the counterpart of this certificate; and also a copy of the rules.

Signed._____

Employment._____

Name, and position of Official giving the authority. } _____

Name, and position of the person presenting the certificate and rules to person authorized. } _____

THE INDIAN MINES ACT, 189 .

Certificate of authorization to possess a key or other contrivance for opening the lock of a safety lamp.

No._____

Mine_____

Section of mine_____

Date _____

I hereby authorize_____ who is at present employed as_____, to possess a key or other contrivance for opening the lock of a safety lamp, on condition that in the possession and use of such key or contrivance the requirements of all rules, notices, or other instructions are constantly observed.

Signature, and position of official issuing the certificate. } _____

Signature, and position of person presenting the certificate. } _____

I hereby accept the above authority, and conditions; and also acknowledge the receipt of a copy of the rules.

Signed_____

# PIONEER COAL COMPANY, LIMITED.

## FIREMAN'S INSTRUCTIONS.

*To*_____, *Fireman.*

I hereby appoint you as a competent person to carry out the provisions of_____

_____,

and a copy will be supplied to you with these instructions.

It will be your duty to especially observe and also enforce to the best of your ability and without malice or favour the following General and Special Rules that are in force at this mine.

*General Rules.*

Nos._____

*Special Rules.*

Nos._____

*Dated* _____.

_____, *Manager.*

# ASSISTANT MANAGER'S REPORT TO MANAGER.

## DAILY REPORT FROM *PIONEER* COLLIERY.

*Time when written,*_____*p.m.,*_____*189* .

| | No. of Men at work. | | No. of Men absent. | | Loss of Time on Surface. | Loss of Time at Bottom. | | No. of Tubs. | Tons. | Cwts. | Qrs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hewers. | Daymen. | Hewers. | Daymen. | | | | | | | |
| | | | | | | | Round | ..... | ..... | ..... | ..... |
| | | | | | | | Small | ..... | ..... | ..... | ..... |
| TO-DAY..... | ..... | ..... | ..... | ..... | ..... | ..... | Dirt | ..... | ..... | ..... | ..... |
| LAST NIGHT | ..... | ..... | ..... | ..... | ..... | ..... | Total | ..... | ..... | ..... | ..... |

1. State of Ventilation? (Gen., 1, 2, 3; Sp., 17, 18.)_____

2. Any Gas? (Gen., 4, 7; Sp., 14, 15, 16, 24.)_____

3. State of Machinery, Guides, and Conductors? (Gen., 5.)_____

4. State of all Entrances to Non-working places? (Gen., 6.)_____

5. State if all Safety Lamps have been examined and found safe? (Gen., 8, 9, 10, 11; Sp., 19.)_____

6. State if all the provisions have been strictly observed with regard to the use of Explosives and Boreholes? (Gen., 12, 13; Sp., 19.)_____

7. State if all Signals and Man-holes are in order? (Gen., 14, 15, 16; Sp., 20.)_____

8. Condition of all Roofs, Sides, Air-ways, and Travelling Roads? (Gen., 17, 18, 19, 20, 21; Sp., 20.)_____

9. State if all Working-Places are safe and well timbered? (Gen., 22; Sp., 21.)_____

10. State if any Breakdowns or Stoppages to Work, and causes of same?_____

11. State if any Accident or Injury to the Men, and cause of same? (Sp., 25.)_____

12. Have all the General and Special Rules been strictly observed? (Gen., 35, Sp., 26.)_____

13. General Remarks and Requirements?_____

*The above is a correct Report of the Workings.*

Signed,_____

*Assistant Manager.*

Note.—This report was made at the end of the first shift.—J. G.

# ASSISTANT MANAGER'S REPORT TO MANAGER.

## DAILY REPORT FROM *COALBROOKDALE* COLLIERY.

*Time when written,*_____*a.m.,*_____*189* .

| | No. of Men at work. | | No. of Men absent. | | Loss of Time on Surface. | Loss of Time at Bottom. | OUTPUT. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hewers. | Daymen. | Hewers. | Daymen. | | | Round. | Small. | Blend. | Total. | Dirt. |
| TO-DAY..... | | | | | | | | | | | |
| LAST NIGHT | | | | | | | | | | | |

1. State what districts of the Pit you examined, and in what condition you found them, and if free from Gas? _____

2. State what main Travelling Roads or other Air-ways you examined, and in what condition you found them? _____

3. Whether any Defect was noticed, and what was done to repair it? _____

4. State of Ventilation? _____

5. State of Working-Places: If Safe? _____

If Props over 6ft. apart? _____

6. State of Man-holes and Signals? _____

7. Have you sufficient Timber? _____

8. State what the Daymen have been working at? _____

9. General Remarks? _____

*The above is a correct Report of the Workings.*

Signed_____,

*Assistant Manager,*

# DEPUTY'S REPORT.

## PROSPECT COLLIERY.

_____ *Mine.*

_____ Shift _____ District _____ 189 .

Gas to be reported whenever found, however small the amount. No workman is, on any pretext, to be allowed to work in gas, nor in any place which is not securely timbered, or which is otherwise unsafe.

No delay to take place with regard to remedying any defect or removing any cause of danger.

1. Is every place properly ventilated, and are the air-crossings, regulators, stoppings, doors, sheets, and brattice in an efficient state? _____

2. Is every place safe as regards roof, sides, timber, etc.? _____

3. Are the man-holes and signal bells, and rods clear, and in safe working order? _____

4. Are the ropes, chains, and machinery in your charge safe and in good working order, and fenced off where necessary? _____

5. Is there a sufficient supply of timber, brattice, and other materials? _____

6. Are the tramming roads, jig brows, and horse roads amply large enough? _____

7. Is there a sufficient supply of trams for colliers? _____

8. Have any accidents taken place, or any stoppages of coal work? _____

9. Has there been any breach of rules? _____

10. Do hewers timber their places, and sprag and hole coal properly? _____

11. Have you any other remarks to make? _____

| No. OF PERSONS. | ABSENT. | AT WORK. | Deputy's Signature. |
|---|---|---|---|
| Officers ..... | | | |
| Datal Men..... | | | |
| Hewers Coaling .... | | | |
| Trammers ..... ..... | | | |
| Hewers at other work | | | |
| Trammers " " | | | |
| Hangers on ..... | | | |
| Drivers, etc., over 16 | | | |
| Ditto. under 16 | | | |
| Contractors ..... | | | |
| Ditto at other work | | | |
| Total... | | | |

Tubs filled—
Coal ...
Dirt ...

Underlooker's Signature.

Assistant Manager's Signature.

2 0

# FIREMAN'S REPORT TO MANAGER.

## DAILY REPORT FROM *COALBROOKDALE* COLLIERY

*Time when written,*_____*a.m.,*_____*189* .

| | No. of Men at Work. | | No. of Men absent. | | Loss of Time on Surface | Loss of Time at Bottom | OUTPUT. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hewers. | Daymen. | Hewers. | Daymen. | | | Round. | Small. | Blend. | Total. | Dirt. |
| TO-DAY . . . | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| LAST NIGHT . . | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

1. Any Gas?_____

2. State of Ventilation?_____

3. State of Air-ways?_____

4. State of Roads, Machinery, Guides, and Conductors?_____

5. State of Man-holes?_____

6. State of all Signals?_____

7. State of all Entrances to Non-working Places?_____

8. State of Working Places: If safe?_____

If Props over 6ft. apart?_____

9. State where the Day-men have been working?_____

10. General Remarks_____

*I hereby Certify that I have examined the whole of the Works underground, and the above is a correct Report.*

Signed_____

*Fireman.*

# PIONEER COAL COMPANY, LIMITED.

## FIREMAN'S DAILY REPORT.

*Made by*.....*Dated*.....*189*.....

.....*Pit.*

State the condition of the Pit Workings in your district, air courses, lodgment of fire-damp; increase or sudden appearance of fire-damp; cutting through into any old workings; discovery of any of the men unlocking or injuring the safety-lamps; men neglecting to prop or sprag; or being seen with any kind of naked light where the same is prohibited, stating the names of the men; also of accidents to any of the men, stating the name, cause and manner of injury received, and whether proceeding from negligence or otherwise; and also of any complaints made by the men, or dissatisfaction expressed by any of them, concerning the insufficient state of ventilation, ill-condition of the pit-ropes, scarcity of prop-timber, or of any other cause or danger connected with their working-places, travelling roads, roof and sides of same.

(1) Are the working-places in a safe condition?_____

(2) Are propping and spragging being attended to?_____

(3) Are the roof and sides of the drawing roads in a safe state?_____

(4) Is the timbering in the roadway being kept in good order?_____

(5) Is the ventilation being kept up?_____

(6) Are the air-doors having your attention?_____

(7) Are the air-ways in good order?_____

(8) Is a sufficient quantity of timber being kept at the timber stations?_____

(9) Have you examined all the accessable parts of the mine in your district?_____

(10) Are the narrow places kept well aired?_____

(11) Are the air-ways across the working-places in good order?_____

(12) Are all the roads not in use being kept fenced off?_____

(13) Are the packs being well kept up in the working places?_____

(14) Are the props being kept drawn in due time?_____

(15) Are the man-holes being kept clear in the roads in your district?_____

(16) Are the air-ways being kept well open from face to face?_____

(17) Have you found any gas? If so, state where._____

(18) State time and hour the above was seen to._____

(19) Firemen.....Daymen.....Hewers.....Trammers.....Boys.....Girls.....Total .

(20) I have carefully attended to all the above conditions in my district, and found them in the state above named._____

(21) Do you notice the barometer and its effects?_____

Signed.....  State time .....

NOTE.—If short of space write on back side of form.

## FIREMAN'S REPORT TO MANAGER.

### DAILY REPORT FROM *PIONEER* COLLIERY.

*Time when written*, _____ *a.m.* _____ *189* .

I hereby certify that I have examined the whole of the Works underground, according to the General Rules 4 and 5, and Special Rules 27, 28, and 29; and the following is a correct Report.

1.—State of Ventilation? (Gen. 1, Sp. 31; 32.)_____

2.—Any Gas? (Gen. 4, 7; Sp. 28.)_____

3.—State of Machinery, Guides, and Conductors? (Gen. 5.)_____

4.—State of all Entrances to Non-working Places? (Gen. 6; Sp. 31, 35.)_____

5.—State if all Safety Lamps have been examined and found safe? (Gen. 10; Sp. 33.)

6.—State if all the provisions have been strictly observed with regard to the use of Explosives? (Gen. 12; Sp. 71, 72, 73, 74, 75, 76.)_____

7.—State if all Signals and Man-holes are in order? (Gen. 14, 15, 16.)_____

8.—Condition of all Roofs, Sides, Air-ways, and Travelling Roads? (Gen. 17, 21.)

9.—State if all Working-Places are Safe and well timbered? (Gen. 22; Sp. 29, 34.)_____

10.—State if any Falls of Roof, and cause of same?_____

11.—State if any Breakdowns or Stoppages to Work, and cause of same?_____

12.—State if any Accident or Injury to the Men, and cause of same?_____

13.—State how many and where the Daymen are employed?_____

14.—State how many men are absent, and give names?_____

15.—General Remarks?_____

(Signed)_____ *Fireman.*

NOTE.—The references are to the General and Special Rules. (General Rules of the English Act, Special Rules of the Manchester district.)

## INSTRUCTIONS TO FIREMEN.

PIONEER COAL AND CANNEL CO., LIMITED.

*6th June, 1894.*

No. 2 PIT. No. 5 DISTRICT.

*To*

WILLIAM SMITH, *Fireman.*

If any Shots are allowed in your district you will have to see to the Firing of such Shots if in your shift, and will carry out the General Rule 12 and Special Rules 71, 72, 73, 74, 75, and 76. As you must strictly enforce these Rules and practise them, you will also see that all Hewers who are getting and filling their Coal all together, are getting them in the best way to make large Coal, and if you should find any Hewer or Hewers not getting their Coal in the best way for large Coal, you will order them to fill their coal in round and small as formerly. You will also see that they use the besoms to clean the small dust and dirt from off the Coal and floor after feighing and before beginning to get their Coal up. You will please see that any man who works by day for this Company does a fair day's work and has a proper set of Tools to work with, and any day-wage man failing to comply with either of the two conditions will be dismissed. And I hope you will see that the Props are kept drawn in time so as to save them being broken by being left behind too long, and that each place is provided with a besom. I also wish you to see to the roads in your district being dusted when needful, and keep the drawing roads a fair height.

(Sd.) ISRAEL JONES,
*Manager.*

NOTE.—All the references are to English Rules.—J. G.

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## INSTRUCTIONS TO FIREMEN AND SHOTLIGHTERS.

*In addition to those contained in the General and Special Rules of the Coal Mines' Regulation Act, 1887.*

1. No one except a Fireman or Shotlighter is allowed, under any circumstances, to charge, stem, or fire a shot.

2. No Fireman or Shotlighter shall stem any hole or fire any shot when from any cause he may think it unsafe to do so.

3. On days when the usual work of winding coal is carried on no shot shall be fired between the hours of 5-30 A.M. and 4 P.M., except in stone tunnels where specially authorised by the Manager.

4. After a shot has been fired the Fireman or Shotlighter should wait 5 minutes before going back to examine the place, unless there is something wrong that requires immediate attention.

5. When a charge has missed fire the Fireman or Shotlighter shall report the same in the Ventilation Report Book, and also in a special book provided for the purpose. If a second shot is required the hole must be commenced at least 12 inches from the one which contains the charge which has missed fire, and must be drilled in such direction as to preserve the same distance from the first hole throughout. After firing the second shot the Fireman or Shotlighter shall satisfy himself that the first charge and detonator has exploded, or shall himself find the detonator or charge, and take such detonator or charge into his own keeping. He shall make a report in the Ventilation and Missed Shot Books, and hand the detonator or charge to the Under-Manager for further examination.

EDWARD THOMPSON, *Manager,*
*Advance Collieries.*

## WAGONS ON COLLIERY RAILWAYS AND SIDINGS.

Precautions to minimise accidents.—

1. The ground where persons have to work should be fairly smooth and the sidings in good order and well lighted.
2. Sufficient head room and side space should be provided for persons engaged on or about the wagons.
3. The brakes should be of sufficient power to stop the wagons on any of the inclines.
4. Wagons in process of loading should not be left standing without the brakes being fastened down.
5. Wagons left on an incline should rest against a stop-block, in addition to the brake being fastened down.
6. The person having charge of the moving of wagons should, before they are moved, give warning to persons who are likely to be affected at the screens, staging, and other places.
7. Where the circumstances admit, a coupling pole should be used as on some railways.
8. All persons should be enjoined to be careful and on the alert to attend to warnings, and keep a good look-out to avoid accidents.

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## RANIGANJ AND SITARAMPUR COMPANY'S COLLIERIES.

### SAFETY LAMPS.

*In addition to the observance of the General and Special Rules, the following Instructions must be strictly carried out by all persons employed at the Raniganj and Sitarampur Co.'s Collieries, with respect to safety lamps.*

1. All safety lamps must be examined by the person appointed at the lamp station near the bottom of the shaft, and locked by means of a leaden plug. Stations are also appointed in each mine where the necessary appliances will be kept for re-lighting lamps and re-plugging the same. These stations to be solely under the control of the fireman or other person authorized in writing by the manager, and under no circumstances shall any lamp which has gone out be re-lighted until the gauzes, glass, etc., have been thoroughly examined.
2. Great care must be taken in the daily examination of the lamps; when this examination is made the gauzes, glass, etc., must be submitted to a minute scrutiny, and if the slightest suspicion is entertained that the lamp is not secure in every bearing, it must be condemned, and used again only when it has undergone such repairs as to render the using of it in every respect safe, and on no account must the person examining the lamps pass any cracked, chipped, or loose glasses.
3. No safety lamp shall be suspended near the goaf or old work, but shall be hung on a prop or chock at a safe distance from the face and beyond the swing of the pick, and must not be placed on the floor.
4. Every person entrusted with a safety lamp must see that the plug is properly stamped, and must not allow the plug to be defaced or damaged in any way; and if during the working, the glass shows the slightest crack, chipping, or becomes loose, or any leakage of the oil takes place, or any part of the lamp in any way insecure, he shall at once extinguish it by pulling down the wick.

5. On the expiration of his shift he shall take the lamp to the lamp room, where the plug will be cut by the person in charge, and in the event of any lamp showing signs of having been tampered with, the person by whom it has been used must be at once reported to the manager.
6. Every workman is held responsible to the owners for the safe and proper usage and return of the lamp entrusted to him, and for any damage caused, or repairs which may be required owing to accident or other cause, and each collier or contractor is also held responsible for any lamps entrusted to his drawer, mate, or workman, but this must not be taken to relieve the drawer, mate, or other person from such responsibility as is necessarily imposed upon the actual user of the lamp.

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## WEST PIONEER COAL COMPANY, LIMITED.

*New Rules to be enforced to comply with Mines Act, commencing 1st of January, 1888.*

### Shot-firing.—

Canisters may now contain 5 lbs. of explosive. No Scraper made of iron is allowed to be in the possession of any one while charging a shot. No coal dust or small coal to be used for stemming. The explosive must not be forcibly pressed into a hole of insufficient size. No shot of any sort must be unrammed, and if a shot has missed fire and another hole is required, it must be placed at least six inches apart from the shot that has missed.

The Shotlighter must not light a shot until he has examined for gas everywhere he can get for 20 yards all round the shot, and found it clear. If any gas has been found in the same ventilating district within the twenty-four hours previous to time of shot-firing, no shot shall be fired in that district unless the gas so found has either been removed, or is not of sufficient quantity to render it unsafe to fire the shot.

In dry and dusty mines the explosive used must be such that it will not inflame gas, or else, if it is powder, etc., the place surrounding the shot must be watered until the roof, floor, and sides are in a wet state for a space of 20 yards.

No shot must be fired in any main haulage, road, or any place close to it where it is dry and dusty, unless it is either watered as above described, or an explosive used that will not inflame gas, and in any case all the men must be out of the mine, except not more than 10 persons besides those engaged in firing the shot.

NOTE.—The Manager will decide what mine, or part of a mine, may be called "dry and dusty," and also what explosive must be used. All previous instructions given with a view to safety in shot-firing that are not affected by the new rules, still remain in force, and of course all shot-firing must be done between the shifts as formerly, except in places where special permission otherwise is given by the Manager.

### Accidents.—

Places where accidents, causing death or serious personal injury, have occurred, must be left undisturbed for three days, or until the Inspector has been, unless it would cause further danger to others, or a stoppage of a main road, etc.

### Guide Rods.—

Guide Rods in shafts are to be examined and reported on daily, in addition to the weekly inspection of the shaft.

Man-Holes.—

Man-Holes in roads worked by ropes other than an endless rope are to be kept every 10 yards, unless there is room for a person to stand between the tubs and the side.

Pony Roads.—

Pony Roads are to be kept such a height that the ponies will not rub against the roof.

Lamp Stations.—

Lamp Stations are not to be placed in return air.

Timber.—

Sprags, when required, never to be more than six feet apart. Proper places to be appointed and kept supplied with timber convenient for the Hewers to obtain it.

Engine-Houses.—

Engine-Houses and Boiler-Houses Underground are to have two proper travelling ways in or out.

Hewers.—

In future no person is to be allowed to work alone at getting coal, unless he has had two years' previous experience at the coal face.

*Manager.*

# 30.—MINING AND MINERAL STATISTICS.

## In England.

On the 20th December 1893, the Secretary of State appointed a Committee "to consider the whole question of Mines and Mineral Statistics in view of the Recommendation No. XI of the Royal Commission on Mining Royalties, as to collecting information with regard to mines." This Committee issued their report in September 1894.

## Present official mining Publications.

During the last few years the following publications have been issued annually by the Home Office :—

1. Summaries of the Statistical portions of the Reports of Her Majesty's Inspectors of mines.
2. Separate report by each Inspector for his own district.
3. The Mineral Statistics of the United Kingdom.
4. Lists of mines at work.
5. List of record plans of abandoned mines deposited in the Home Office.

In addition to these annual publications, special reports are prepared relating to accidents causing great loss of life.

No. 3, "the Mineral Statistics of the United Kingdom" contains the following matter :—

(*a*) Particulars of the output and value of all minerals raised from mines, the output and value of certain minerals obtained from open workings; and also the quantity and value of the metals contained in the various ores.

(*b*) Statistics relating to the import and export of minerals and metals; railway and canal traffic of coal, salt, etc.; shipments of coal, clay, and other minerals, coastwise; particulars of blast furnaces giving the production of pig iron and the quantity of iron ore, and coals used in its manufacture; the average weekly prices of coal and metals in the London market; lists of smelters of ores, with their addresses; also an appendix giving the output and value of all the minerals raised in the British Colonies and Possessions. The book likewise contains maps showing the mines inspection districts, and a list of the names and addresses of the inspectors.

The information under (*a*) is obtained by the Inspectors of mines, partly from Statutory returns as to quantities, and partly from information afforded voluntarily. The information under (*b*) is ascertained without Statutory powers by the Mineral Statistics Branch of the Home Office, independently of the Inspectors of mines, partly by means of circulars and letters issued through the Department and partly from official and other sources.

## Suggestions for future Statistics.

The suggestions made by the Royal Commission on Mining Royalties with respect to Mining Statistics (pages 12 and 80 of the Final Report of the Commission) are as follows :—

Page 12, paragraph 51.—"During the course of our inquiries our attention has been directed to the fact that statistics relating to minerals issued in this country are incomplete, and are at times misleading. One cause of this may be the absence of compulsory powers to obtain necessary information. Beyond all doubt our mining statistics fall far behind those issued by other States (including our Colonies) whose mineral resources may be comparatively small.

There should be but little difficulty in ascertaining accurately the total amount of royalties and way-leaves, the average price of coal, and the average wages, but on these points at the present time our information is either wanting or incomplete. We venture to suggest that Her Majesty's Government should consider the advisability of re-organising and extending what we may call the Department of Mines in the Home Office, and that to such Department should be committed the duty of collecting and publishing accurate information relating to the following, amongst other matters:—

"1. The quantity of coal used for manufacturing, and domestic purposes, respectively.

"2. The amount of royalties and way-leaves.

"3. The average price of coal at the pit's mouth, and at various points of consumption.

"4. The wages and hours of labour of miners.

"5. Imports and exports of mineral.

"6. The comparison of the progress of the mining industry in the United Kingdom and in Foreign countries."

The reasons which influenced the Royal Commission on mining Royalties in the desire to obtain this information was stated by Dr. Munro to be: "That in considering the effect of higher cost of production on the coal trade, due to either higher wages or higher prices, in connection with foreign competition, it was thought desirable to draw a wide distinction between coal used for manufacturing purposes, and coal used for domestic purposes; for instance, a rise in wages, so far as concerns coal used for domestic purposes, would not affect the cost of production in manufactures. It was, therefore, thought that it would be well, so far as it might be practicable, to form an estimate year by year of the amount of coal used for manufacturing and domestic purposes respectively, so that one might be able to judge how far the movements in wages and prices in England tend to affect the cost of production in our industries, either by restricting the amount of coal used, or by leading to the adoption of other sources of motive power."

The following tables comprise the recommendations of the Mining and Mineral Statistics Committee; and these recommendations were included in a new Mines Bill that the Secretary of State recently introduced in the English House of Commons.

# MINING AND MINERALS STATISTICS COMMITTEE.

## APPENDIX II.

**The following headings are suggested for some of the Tables of the proposed Annual General Report on the Mining Industry.**

TABLE 1.

### PERSONS EMPLOYED* AT ALL THE MINES† OF THE UNITED KINGDOM.

*Total number of Mines Worked and of Persons employed in all Mines in the United Kingdom, whether worked for Coal, Ores, Stone, or other Minerals—but not including Persons Employed in Quarries.‡*

| Total number of Mines. | Under Ground. | Above Ground. (Including Persons employed in washing Minerals, in coking Coal, and on Private Branch Railways and Tramways on Premises adjacent to, and belonging to, the Mine.) | | Total Under Ground and Above Ground. |
|---|---|---|---|---|
| | Males. | Males. | Females. | |
| | | | | |

* The term "persons employed" denotes the number ordinarily employed and is the mean between two censuses, one taken in summer and the other in winter.

† The term "mine" includes working below ground by artificial light for the purpose of searching for or proving or working minerals, irrespective of the naturelof the minerals, but does not include excavations open to daylight, unless they are immediately connected with mines. The term also includes works, tramways, and sidings above ground, adjacent to, and belonging to, the mine.

‡ The term "quarry" includes every place (not being a mine) in which persons work in getting slate, stone, coprolites, or other minerals.

TABLE 2.

### COAL MINES.—PERSONS EMPLOYED.

*Number of Persons employed in and about Coal Mines* classified according to Age, Sex, and Coalfields.*

| Name of Coalfield or County. | Number of Mines. | Under Ground. | | | Above Ground. | | | | | | | | Total Under Ground and Above Ground. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Males. | | | Males. | | | | Females. | | | | |
| | | Ages, 12 to 16. | Ages, above 16. | Total Under Ground. | Ages, 12 to 13. | Ages, 13 to 16. | Ages, above 16. | Total. | Ages, 12 to 13. | Ages, 13 to 16. | Ages, above 16. | Total Above Ground. | |
| | | | | | | | | | | | | | |

* The term "Coal Mines" includes mines producing coal alone or coal together with other minerals such as ironstone, fireclay, etc.

## TABLE 3.

## COAL MINES.

*Percentages of the Number of Persons of Different Ages employed in the several Coalfields.*

| Name of Coalfield or County. | Under Ground. | | | Above Ground. | | | | | | | Under Ground and Above Ground. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Males. | | | Males. | | | Females. | | | Total. | |
| | Ages, 12 to 16. | Ages, above 16. | Total. | Ages, 12 to 13. | Ages, 13 to 16. | Ages, above 16 | Ages, 12 to 13. | Ages, 13 to 16. | Ages, above 16. | | |
| | Per-centage. | Per-centage. | Per-centage. | Per-centage. | Per-centage. | Per-centage. | Per-centage. | Per-centage. | Per-centage | Per-centage. | |

## TABLE 4.

## COAL MINES.

*Quantity raised, Value at Pit's Mouth, Average Price per ton, Total Persons employed, and Output per Person in the several Coalfields.*

| Name of Coalfield or County. | Coal. | | | Ironstone; Fireclay, etc., produced from Coal Mines. | Persons employed. | Quantity raised per Person. |
|---|---|---|---|---|---|---|
| | Quantity raised. | Total Value at Pit's Mouth. | Average Price per Ton. | Quantity raised. | | |
| | Statute tons. | £ | s. d. | Statute tons. | | Tons. |

## TABLE 5.

## COAL MINES.—FATAL ACCIDENTS.

*Number of Accidents and Deaths during the Year, with the Proportion of Deaths Under Ground and Above Ground to 1,000 Persons employed and of all Deaths to every Million Tons of Mineral Raised.*

| Total Number of Accidents. | Total number of Deaths from Accidents. | | | Death-rate from Accidents. | | | Number of Deaths per 1,000,000 Tons of Mineral raised. |
|---|---|---|---|---|---|---|---|
| | Under Ground. | Above Ground. | Total. | Per 1,000 Persons employed Under Ground. | Per 1,000 Persons employed above Ground. | Per 1,000 Persons employed Above and Below Ground. Total. | |
| | | | | | | | |

## TABLE 6.

## COAL MINES.—FATAL ACCIDENTS.

*Number of Accidents and Deaths therefrom during the Year, showing the Proportion of Deaths Under Ground and Above Ground to 1,000 Persons employed, and of all Deaths to every 1,000,000 Tons of Mineral raised; classified according to Coalfields.*

| Name of Coalfield or County. | Number of Accidents. | Number of Deaths. | | | Death-rate from Accidents per 1,000 Persons employed. | | | Number of Deaths per 1,000,000 Tons raised. |
|---|---|---|---|---|---|---|---|---|
| | | Under Ground. | Above Ground. | Total. | Under Ground | Above Ground. | Total. | |
| | | | | | | | | |

## TABLE 7.

## COAL MINES.—FATAL ACCIDENTS.

*Ages and Sexes of Persons killed.*

| Ages. | Under Ground. | Above Ground. | | | Total under and above Ground. |
|---|---|---|---|---|---|
| | Males. | Males. | Females. | Total. | |
| Under 16 . . . | | | | | |
| 16 to 20 . . . | | | | | |
| 20 to 30 . . . | | | | | |
| 30 to 60 . . . | | | | | |
| Over 60 . . . | | | | | |
| Total . | | | | | |

## TABLE 8.

## COAL MINES.—FATAL ACCIDENTS.

*Causes of Fatal Accidents in the several Coalfields of the United Kingdom.*

| Name of Coalfield or County. | UNDER GROUND. | | | | | | | | | | | | | | | | | | | | | | | | ABOVE GROUND. | | | | | Gross Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Explosions of Fire-damp or Coal Dust. | Falls of Ground. | | | In Shafts. | | | | | | | | | Miscellaneous. | | | | | | | | | | Total Under Ground. | | | | | | |
| | | Sides. | Roof. | Total Falls. | Overwinding. | Ropes and Chains breaking. | Whilst ascending or descending by Machinery. | Falling into Shaft from Surface. | Things falling from Surface. | Falling from part way down. | Things falling from part way down. | Miscellaneous. | Total in Shafts. | By Explosives. | Suffocation by natural Gases. | Irruptions of Water. | Falling into Water. | On Inclined and Engine Planes. | By Trams and Tubs. | By Machinery. | By Under Ground Fires. | Ropes and Chains breaking. | Miscellaneous. | Total Miscellaneous. | | By Machinery. | Boilers bursting. | Railways and Tramways. | Miscellaneous. | Total Above Ground. | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## TABLE 9.

## COAL MINES.—FATAL ACCIDENTS.

*Table showing Percentage Proportion of the several Causes of Accidents to Total Fatal Accidents.*

| Name of Coalfield or County. | UNDER GROUND. | | | | | | | | | | | | | | | | | | | | | | | | ABOVE GROUND. | | | | | Gross Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Explosions of Fire-damp or Coal Dust. | Falls of Ground. | | | In Shafts. | | | | | | | | | Miscellaneous. | | | | | | | | | | Total Under Ground | | | | | | |
| | | Sides. | Roof. | Total Falls. | Overwinding. | Ropes and Chains breaking. | Whilst ascending or descending by Machinery. | Falling into Shaft from Surface. | Things falling from Surface. | Falling from part way down. | Things falling from part way down. | Miscellaneous. | Total in Shafts. | By Explosives. | Suffocation by natural Gases. | Irruptions of Water. | Falling into Water. | On Inclined and Engine Planes. | By Trams and Tubs. | By Machinery. | By Under Ground Fires. | Ropes and Chains breaking. | Miscellaneous. | Total Miscellaneous. | | By Machinery. | Boilers bursting. | Railways and Tramways. | Miscellaneous. | Total Above Ground. | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TABLE 10.

## COAL MINES.—FATAL ACCIDENTS.

*Nature of Employment of Persons killed.*

| Name of Coal-field or county. | UNDER GROUND. | | ABOVE GROUND. | | TOTAL. |
|---|---|---|---|---|---|
| | Excavating Coal, other Minerals, or Rock. | Other Occupations. | Picking, Screening, and Washing. | Other Occupations. | |
| | | | | | |

TABLE 11.

## COAL MINES.

*Comparison of Coal-fields as to Mineral raised, Value, Persons employed, and Deaths from Accidents.*

| Name of Coal-field or County. | Percentage of Total Mineral raised. | Percentage of Total Value. | Percentage of Total Number of Persons employed. | Percentage of Total Number of Deaths from Accident. |
|---|---|---|---|---|
| | | | | |

All the particulars shown in Tables 2, 3, 4, 6, 8, 9, 10, and 11 should be given for counties separately, as well as for coal-fields separately.

Tables similar to Nos. 2 to 11 may be prepared for iron ore or other minerals separately where practicable.

## TABLE 12.

## PERSONS INJURED BY NON-FATAL ACCIDENTS.

*Number of Persons injured by Non-fatal Accidents during the Year 189 .*

| Number and name of Districts. | Nature of Injury. | | | | | | | | | | | | Period of Disablement. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Loss of right Hand or Arm. | Loss of left Hand or Arm. | Loss of part of Right Hand. | Loss of part of Left Hand. | Loss of any part of Leg or Foot. | Fracture of Limbs or Bones of Trunk. | Fracture of Hand or Foot. | Loss of Sight of one or both Eyes. | Injuries to Head and Face. | Burns or Scalds. | Lacerations, Contusions, and other Injuries not enumerated. | Total Number injured. | Less than one week. | Between one and two weeks. | Between two weeks and one month. | Between one and three months. | Between three months and six months. | More than six months. | Permanently disabled from following his ordinary Occupation. | Unknown. | Total Number injured. |
| 1. Scotland, East . . . . | | | | | | | | | | | | | | | | | | | | | |
| 2. Scotland, West . . . . | | | | | | | | | | | | | | | | | | | | | |
| 3. Newcastle . . . . | | | | | | | | | | | | | | | | | | | | | |
| 4 Durham . . . . | | | | | | | | | | | | | | | | | | | | | |
| 5. Yorkshire and Lincolnshire . . | | | | | | | | | | | | | | | | | | | | | |
| 6. Manchester and Ireland . . | | | | | | | | | | | | | | | | | | | | | |
| 7. Liverpool . . . . . | | | | | | | | | | | | | | | | | | | | | |
| 8. Midland . . . . . | | | | | | | | | | | | | | | | | | | | | |
| 9. North Wales, etc. . . . | | | | | | | | | | | | | | | | | | | | | |
| 10. Staffordshire, North . . | | | | | | | | | | | | | | | | | | | | | |
| 11. Staffordshire, South . . | | | | | | | | | | | | | | | | | | | | | |
| 12. South-Western . . . . | | | | | | | | | | | | | | | | | | | | | |
| 13. South Wales . . . | | | | | | | | | | | | | | | | | | | | | |
| Totals in 189 . . | | | | | | | | | | | | | | | | | | | | | |
| Totals in the preceding year . . | | | | | | | | | | | | | | | | | | | | | |

## TABLE 13.

## PROSECUTIONS.

*Name of District*_____.

| | Name of Mine. | Description of Offender. | Contravention. | Result of Trial. | Penalty. | Costs. | |
|---|---|---|---|---|---|---|---|
| | | | | | £. s. d. | £. s. d. | |
| | | | | | | | |

## TABLE 14.

*List of Mines, Owners, and Managers, under the Coal Mines Regulation Act, in the*_____*District, for the Year 189* .

*County of*_____.

| Name of Mine. | Situation. | Owner and Postal Address. | Manager. | No. of Certificate. | Under-Manager. | No. and Class of Certificate. | Date of Signature of Special Rules. | Persons employed. | | Minerals worked. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Below ground. | Above ground. | |
| | | | | | | | | | | |

## TABLE 15.

*List of Mines, Owners, and Agents under the Metalliferous Mines Regulation Act, in the*_____*District, for the Year 189* .

*County of*_____.

| Name of Mine. | Situation. | Owner and Postal Address. | Agent. | Date of Signature of Special Rules. | Persons employed. | | Minerals worked. |
|---|---|---|---|---|---|---|---|
| | | | | | Below ground. | Above ground. | |
| | | | | | | | |

Table 15 should likewise be used for the List of Quarries, omitting the column "Below ground."

TABLE 16.

# FORM OF RETURN FOR MINES UNDER THE COAL MINES REGULATION ACT.

## Minerals Raised, Distribution, Prices, Royalties and Way-leaves.

*Year ending 31st December 189 .*

Name and Situation of Mine _____.

County _____.

Name of Owner (Company) _____. Postal Address _____.

### *Coal Raised.*

| For Colliery Consumption. | | | | For Domestic Consumption. | | For the Manufacture of Coke. | | For the Manufacture of Gas. | | For other manufacturing Purposes. | | For Export. | | Distribution Unknown. | | Total Coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boilers, Workshops, etc. | Average Price per Ton at Pit. | Workmen's Fire-coal. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. |
| Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* |
| | | | | | | | | | | | | | | | | | |

### *Other Minerals Raised.*

| IRONSTONE (RAW). | | FIRE-CLAY. | | OIL SHALE. | | OTHER MINERALS. | |
|---|---|---|---|---|---|---|---|
| Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. | Quantity. | Average Price per Ton at Pit. |
| Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* | Statute Tons. | *s. d.* |
| | | | | | | | |

### *Royalties, Rents and Way-leaves.*

| COAL. | | | | IRONSTONE. | | | | FIRE-CLAY. | | | | OIL SHALE. | | | | *viz.*— OTHER MINERALS. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rate of Royalty or Rent. | Rate of Way-leave. | Total Amount paid. | | Rate of Royalty or Rent. | Rate of Way-leave. | Total Amount paid. | | Rate of Royalty or Rent. | Rate of Way-leave. | Total Amount paid | | Rate of Royalty or Rent. | Rate of Way-leave. | Total Amount paid. | | Rate of Royalty or Rent. | Rate of Way-leave. | Total Amount paid. | |
| | | Royalty or Rent. | Way-leave. | | | Royalty or Rent. | Way-leave. | | | Royalty or Rent | Way-leave. | | | Royalty or Rent. | Way-leave. | | | Royalty or Rent. | Way-leave. |
| | | £ | £ | | | £ | £ | | | £ | £ | | | £ | £ | | | £ | £ |
| | | | | | | | | | | | | | | | | | | | |

## TABLE 17.

## WAGES RETURN.

Name of Mine_____.

Situation of Mine_____.

County_____.

Name of Owner (Company)_____.

Postal Address_____.

*Return for the Week, Fortnight, or month, ending*_____ *189* .*

| UNDER GROUND. | | | | | | ABOVE GROUND. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Persons employed in getting Coal, Ore, Stone, or other Minerals, or in Sinking, Driving, or Excavating. | | Other Persons employed under ground (excluding Officials, such as Foremen, Overmen, and Deputies.) | | | | Persons employed in Picking, Screening, Washing, Coking, Conveying, etc. (excluding Officials). | | | | | | | | Skilled Mechanics (Carpenters, Smiths, Fitters, etc.) | | | |
| | | | | | | Males. | | | | Females. | | | | | | | |
| | | Under 16 Years of Age. | | Above 16 Years of Age. | | Under 16 Years of Age. | | Above 16 Years of Age. | | Under 16 Years of Age. | | Above 16 Years of Age. | | Under 16 Years of Age. | | Above 16 Years of Age. | |
| Number of Persons. | Net Earnings.† | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. | Number of Persons. | Net Earnings. |
| | £ | | £ | | £ | | £ | | £ | | £ | | £ | | £ | | £ |
| Number of Shifts.‡ | — | Number of Shifts. | — | Number of Shifts. | — | Number of Shifts. | — | Number of Shifts. | — | Number of Shifts. | — | Number of Shifts. | — | Number of Shifts. | — | Number of Shifts. | — |
| | | | | | | | | | | | | | | | | | |

* This return should give the actual net earnings for the first complete period of payment [whether week, fortnight, or month, according to the local practice] ending after 15th May or 15th November.

† By "net earnings" is meant the amount which a person receives after all deductions have been made for materials, tools, and sharpening.

‡ By "number of shifts" is meant the total number of individual shifts worked by the persons during the period.

## TABLE 18.

## RETURN OF SHIFTS WORKED.

Name of Mine_____.
Situation of Mine_____.
County_____.
Name of Owner (Company)_____.
Postal Address _____.

*Return for the Year ending 31st December 1894.*

| UNDER GROUND. | | | | | | | | | ABOVE GROUND. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Persons employed in getting Coal, Ore, Rock, Stone, or other Mineral, or in Sinking, Driving, or Excavating. | | | Other Persons employed underground (excluding Officials, such as Foremen, Overmen, and Deputies). | | | | | | Persons employed in Picking, Screening, Washing, Dressing, Coking, Conveying, etc. (excluding Officials). | | | | | | | | | | Skilled Mechanics (Carpenters, Smiths, Fitters, etc.) | | | | |
| | | | | | | | | | Males. | | | | | | Females. | | | | | | | | |
| | | | Under 16 Years of Age. | | | Above 16 Years of Age. | | | Under 16 Years of Age. | | | Above 16 Years of Age. | | | Under 16 Years of Age. | | | Above 16 Years of Age. | | | Under 16 Years of Age. | | | Above 16 Years of Age. | | |
| Average Number employed.§ | Total Number of Shifts worked for the Year.* | Length of Shifts.† | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.† | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.† | Average Number employed. | Total Number of Shifts worked for the Year.* | Lenght of Shifts.‡ | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.‡ | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.‡ | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.‡ | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.‡ | Average Number employed. | Total Number of Shifts worked for the Year.* | Length of Shifts.‡ |
| | | Hours | | | Hours. | | | Hours. | | | Hours. | | | Hours. | | | Hours. | | | Hours. | | | Hours. | | | Hours. |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |

* "The total number of shifts worked for the year" should be the whole number of shifts worked by all the persons employed.
† Length of shift from bank to bank.
‡ Inclusive of meal time.
§ The "average number employed," means the average of the two periods in June and December selected for the Wages Returns.

TABLE, 19.

## Form of Return for Mines under the Metalliferous Mines Regulation Acts.

RETURN FOR THE YEAR ENDING 31ST DECEMBER 189 .

Name of Mine_____

Situation of Mine_____

County_____

Name of Owner (Company)_____

Postal Address_____

*Number of Persons ordinarily Employed during the year.*

The term "persons ordinarily employed," denotes the mean between two censuses one taken in summer and the other in winter.

| Under Ground. | | | | Above Ground. Including persons employed in dressing minerals, and on private branch railways and tramways on premises adjacent to, and belonging to the Mine. | | | | | | | Total Number of Persons employed Above Ground and Under Ground. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Male Persons. | | | | Males. | | | Females. | | | Total. | |
| Ages 12 to 13. | Ages 13 to 16. | Ages above 16. | Total. | Ages 10 to 13. | Ages 13 to 18. | Ages above 18. | Ages 10 to 13. | Ages 13 to 18. | Ages above 18. | | |
| | | | | | | | | | | | |

*Mineral Dressed, and Undressed Mineral Sold, Treated, or Used during the year.*

| Description of the Mineral. | Undressed Mineral. | | | Dressed Mineral. | | | | Rent, Royalties, and Wayleaves. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity raised. | Percentage of Metal in the Undressed Ore. | Value of the Undressed Mineral at the Mine as raised. | Quantity of Undressed Mineral from which the Dressed Mineral was extracted. | Quantity of Dressed Mineral produced. | Percentage of Metal in the Dressed Ore. | Value of the Dressed mineral at the Mine. | Rate of Rent or Royalties. | Rate of Wayleaves. | Total amount paid. For Rent or Royalties. | Total amount paid. For Wayleaves. |
| | Statute Tons. | | £ | Statute Tons. | Statute Tons. | £ | £ | £ | £ | £ | £ |
| Alum Shale | | | | | | | | | | | |
| Arsenical Pyrites | | | | | | | | | | | |
| Barytes | | | | | | | | | | | |
| Chalk | | | | | | | | | | | |
| Clay, China Clay, Fireclay, Potters' clay. | | | | | | | | | | | |
| Copper Ore | | | | | | | | | | | |
| Copper Precipitate | | | | | | | | | | | |
| Flint or Chert | | | | | | | | | | | |
| Gold Ore | | | | | | | | | | | |
| Gypsum | | | | | | | | | | | |
| Iron Ore | | | | | | | | | | | |
| *Lead Ore | | | | | | | | | | | |
| Limestone | | | | | | | | | | | |
| Ochre | | | | | | | | | | | |
| Phosphate of Lime | | | | | | | | | | | |
| Rock Salt | | | | | | | | | | | |
| Salt from Brine | | | | | | | | | | | |
| Salt contained in Brine and used for other purposes than Salt making. | | | | | | | | | | | |
| Slate | | | | | | | | | | | |
| Stone | | | | | | | | | | | |
| Tin Ore | | | | | | | | | | | |
| Zinc Ore | | | | | | | | | | | |
| Other Minerals, *viz.*:— | | | | | | | | | | | |

* If the mineral contains silver, state the number of ounces per statute ton of dressed ore

Signed _____ Owner, Agent, or Manager.

_____ 189 .

TABLE 20.

## Notice of Accident Form.

_____MINES REGULATION ACT.

**Accident No.**_____189__.

(*Number to be filled in by the Inspector*).

The following accidents should be reported immediately: (1) any accident causing loss of life; (2) any accident caused by an explosion of gas, or of any explosive, or of any steam boiler, and (3) any accident causing the fracture of any bone of a person employed.

(4) Any accident which has occasioned an absence from work of more than seven days should be reported within eight days after its occurrence.

1. Date and Hour of Accident_____
2. Hour of Shift, or Number of Hours worked when Accident happened_____
3. Name of Mine_____
4. Name of Owner_____
5. Name of Person injured [killed]_____
6. Reputed Age_____
7. Occupation_____
8. Place of Accident_____
9. Cause of Accident_____

10. Nature of Injury_____
11. Probable duration of Disablement_____

(Signed)_____, Owner, Agent, or Manager.

Date _____189__.

. . . . . .

To_____, H.M. Inspector of Mines,_____

SIR,

I beg to inform you that_____, who met with an accident on_____ [died from the effects of the injury] returned to work on_____.

The result of the injury received is as follows:—

| Result of Injury. | | | | | | | | | | | | Duration of Disablement. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Death. | Loss of Right Hand or Arm. | Loss of Left Hand or Arm. | Loss of Part of Right Hand. | Loss of Part of Left Hand. | Loss of any Part of Leg or Foot. | Fracture of Limbs or Bones of Trunk. | Fracture of Hand or Foot. | Loss of Sight of one or both Eyes. | Injuries to Head and Face. | Burns or Scalds. | Lacerations, Contusions, and other Injuries not enumerated. | |
| | | | | | | | | | | | | Days. |

I am, Sir,

Your obedient Servant_____

NOTE.—A telegram will constitute a notice in writing within the terms of the Act, and in the case of a fatal accident or an explosion, the cost thereof, not exceeding one shilling, will be refunded by the Inspector. It is requested that full particulars should be sent by post on the form.

## PRESENT ENGLISH MINING RETURNS.

There has recently been occasion for so many comparisons being made between Indian proposals and present English practices, that I give copies of the forms on which the Annual Returns have hitherto been made. This is done with a view to comparisons being made between what are actual facts rather than what are supposed to be.

**Mines (Coal) No. 7 Form.**

### COAL MINES REGULATION ACT, 1887.

### (50 & 51 Vict., c. 58.)

SECTION 33, AND SCHEDULE THREE, PARTS A. & B.

FORMS OF RETURNS.

*These Forms to be correctly filled up by the Owner, Agent, or Manager, and sent to the Inspector of the District, on behalf of the Secretary of State, on or before 21st January, every year.*

PART A.

*Year ending 31st December, 1894.*

Name of Mine_____

Situation of Mine_____

County_____

Name and Address of Owner (Company) _____

_____

Name of Manager_____

No. of his Certificate_____

Name of Under-Manager_____

No. of his Certificate_____

Postal Address of Mine_____

*Name and address of H.M. Inspector of Mines for the District:—.*

NOTE.—The Inspectors of Mines are not required to supply this Form unless application be made for a copy. It is imperative under the Act that the Return be sent within the time named.

**Mines (Coal) No. 7 Form.**

PART A.—*continued.*

*Return of Persons ordinarily employed during the year 1894 :—*

(*a*) UNDER GROUND.

| | Number. | Total Number. |
|---|---|---|
| Boys of 12 and under 16 . . . . | ..... ..... | |
| Males above 16 . . . . . | ..... | |
| Total . . ... ... | | ..... |

(*b*) ABOVE GROUND.

(Including those on sidings at the pit, but not those on branch railways, or at brick-making, or washing or coking of coal.)

| | Number. | Total Number. |
|---|---|---|
| Boys of 12 and under 13 . . . . | ..... | |
| Girls ditto . . . . | ..... | |
| Boys of 13 and under 16 . . . . | ..... | |
| Girls ditto . . . . | ..... | |
| Females above 16 . . . . . | ..... | |
| Males ditto . . . . . | ..... | |
| Total . . | ... ... | ..... |
| Sum-total of (*a*) and (*b*) ... ... | | ..... |

(*c*) ABOVE GROUND.

(Persons employed on private branch railways and tramways and in washing, and coking of coal on premises, adjacent to or belonging to the mine.)

| | Number. | Total Number. |
|---|---|---|
| Boys of 12 and under 13 . . . . | ..... | |
| Girls ditto . . . . | ..... | |
| Boys of 13 and under 16 . . . . | ..... | |
| Girls ditto . . . . | ..... | |
| Females above 16 . . . . . | ..... | |
| Males ditto . . . . . | ..... | |
| Total . . . . . | | ..... |
| Gross total of persons employed under ground and aboveground, working in connection with the colliery . . . . . | | ..... |

_____day of_____1895.

(Signed) _____

**Mines (Coal) No. 7 Form.**

PART A.—*continued.*

## RETURN OF MINERAL WROUGHT.

*Quantity of Mineral wrought during the year ending 31st December 1894.*

| Mineral Wrought. | Number of Statute Tons Wrought. |
|---|---|
| Coal | |
| Fire-clay | |
| Ironstone | |
| Shale—Oil Shale | |
| Do. used for other purposes | |
| Copperas Lumps, or Iron Pyrites | |
| Other Minerals, *viz.*:— | |
| | |
| | |
| | |

*The Number of Days in each Month on which Coal or Ironstone has been drawn.*

| 1894. | Number of Days on which was drawn. | |
|---|---|---|
| | 1. Coal. | 2. Ironstone. |
| January | | |
| February | | |
| March | | |
| April | | |
| May | | |
| June | | |
| July | | |
| August | | |
| September | | |
| October | | |
| November | | |
| December | | |

_____ day of _____ 189 .

(Signed) _____

Mines (Coal) No. 7 Form.

## PART B.

## PARTICULARS OF VENTILATION.

*Name of the Mine*_____.

| NAME OF SEAM. | MODE OF VENTILATION, WITH DESCRIPTION. | DIAMETER AND DEPTH OF DOWNCAST AND UPCAST SHAFTS. | | | | Number of Splits and Quantity. | | AIR-WAYS | | Average Total Quantity of fresh air per minute. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Downcast. | | Upcast. | | | | Length of Splits. | Sectional Area. | |
| | | Diameter in feet. | Depth in feet. | Diameter in feet. | Depth in feet. | Splits. | Quantity in cubic feet per minute. | Yards. | Square feet. | Cubic feet. |
| | | | | | | | | | | |

_____ day of _____ 1895.

(Signed.) _____.

NOTE.—In the case of any Mine not required by the Act to be under the control of a Certificated Manager [*i.e.*, a Mine in which not more than 30 persons are employed below ground—*Sec.* 20 (*c*)], the particulars contained in Part B need not be given unless prescribed by the Secretary of State.—*Sec.* 33 (1).

## PART A—*continued.*

***Return of Persons ordinarily employed, the Quantity of Minerals wrought, and the number of days in each month on which Coal or Ironstone has been drawn, during the year 189 .***

| Name or Number of Pit. | Under Ground. (A) | | | Above ground—at the Mine. (B) [Including those on Sidings at the Pit, but not those enumerated under (C) ]. | | | | | | | Total of (A and B) | Above Ground—adjacent to the Mine. (C) (Employed on private Branch Railways and Tramways, and in Washing and Coking Coal on premises adjacent to, or belonging to, the Mine). | | | | | | | Gross Total of persons employed Under Ground and Above Ground in connection with the Colliery (A, B, and C). |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male Persons. | | | Ages, 12 to 13. | | Ages, 13 to 16. | | Ages, Above 16. | | Total (B). | | Ages, 12 to 13. | | Ages, 13 to 16. | | Ages, Above 16. | | Total (C). | |
| | Ages, 12 to 16. | Ages, Above 16. | Total (A). | Boys. | Girls. | Boys. | Girls. | Females. | Males. | | | Boys. | Girls. | Boys. | Girls. | Females. | Males. | | |
| | | | | | | | | | | | | | | | | | | | |
| TOTAL . | | | | | | | | | | | | | | | | | | | |

| Name or Number of Pit. | Minerals wrought in Statute Tons. | | | | | | | | Number of Days in each month on which Coal or Ironstone has been drawn. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coal. | Fireclay. | Ironstone. | Shale. | | Copperas lumps or iron Pyrites. | Other Minerals. | | Total Tons wrought. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Total Days. |
| | | | | Oil shale. | Used for other purposes. | | Tons. | Description. | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL . | | | | | | | | | | | | | | | | | | | | | | |

## An Extraordinary or Special Form.

DEAR SIR,

I am directed by the Secretary of State to furnish him at the earliest possible opportunity with information regarding the hours of labour of Miners.

With this object I shall be much obliged if you will kindly fill in the annexed Form and return it to me within three days, if you can possibly do so.

*H. M. Inspector of Mines.*

*To*_____

_____

*Name of Colliery or Mine*_____

| | Number of Persons. | Number of hours per day from Bank to Bank (surface to surface). | Interval allowed for meals per day. | Hours per day actually employed at work at the face by Miners. | Usual Number of days worked per week. |
|---|---|---|---|---|---|
| UNDER GROUND. | | | | | |
| Men and Boys engaged in getting Minerals . . . | | | | | |
| Men and Boys engaged in conveying Minerals from the face to the pit bottom . . | | | | | |
| All other underground workers not included in the above . | | | | | |

| | Number employed. | Number of hours per day, exclusive of meal times. | Intervals allowed for meals per day. | Usual Number of days worked per week. |
|---|---|---|---|---|
| ABOVE GROUND. | | | | |
| Persons employed on the surface. | | | | |

Usual Number of hours per day during which minerals are drawn to the surface . . . . . Hours.

Do you think that the day's work could be shortened without lessening the output, if the appliances for drawing and winding were improved? . . .

*Signed*_____

*To be returned to*_____

*H. M. Inspector of Mines*

METALLIFEROUS MINES REGULATION ACTS, 1872 & 1875 (35 & 36 VIC. C. 77; 38 & 39 VIC., C. 39).

**Form prescribed by the Secretary of State.**

FOR RETURN of Persons ordinarily employed in and about each Mine, and quantity in statute weight of Mineral dressed, and of the undressed Mineral sold, treated, or used. This Form, under the Act of 1875, has to be correctly filled up by the Owner or Agent of each Mine, and sent, on or before the 1st of February every year, to the Inspector of Mines of the District, on behalf of the Secretary of State.

RETURN FOR THE YEAR ENDING 31ST DECEMBER, 189 .

Name of Mine_____

Situation of Mine_____

County_____

Name of Owner (Company)_____

Postal Address_____

NUMBER OF PERSONS ORDINARILY EMPLOYED DURING THE YEAR.

| UNDER GROUND. | | | | ABOVE GROUND. Including Dressers within the boundary of the Mine. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MALE PERSONS. | | | | 10 to 13 | | 13 to 18 | | Above 18 | | TOTAL. | Total number of Persons employed Above Ground and Under Ground. |
| 12 to 13 | 13 to 16 | Above 16 | TOTAL. | Males. | Females. | Males. | Females | Males. | Females. | | |
| | | | | | | | | | | | |

MINERAL DRESSED, AND UNDRESSED MINERAL SOLD, TREATED, OR USED DURING THE YEAR.

| KIND OF MINERAL. | Quantity of Mineral. | | The filling up of these 2 columns is voluntary, but the information is particularly requested for the purpose of preparing the Mineral Statistics. | |
|---|---|---|---|---|
| | Mineral dressed. | Undressed Mineral Sold, Treated, or used (exclusive of that which has been stocked, or from which Mineral has been dressed) | Average percentage of Metals. | Value at the Mine of the Quantity returned. |
| | Statute Tons. | Statute Tons. | | £ |
| Alum Shale | | | | |
| Arsenic | | | | |
| Barytes | | | | |
| China Clay | | | | |
| Copper Ore | | | | |
| Copper Precipitate | | | | |
| Coprolites | | | | |
| Fireclay | | | | |
| Gypsum | | | | |
| Iron Ore | | | | |
| Iron Pyrites | | | | |
| Lead Ore | | | | |
| Ochre | | | | |
| Phosphatic Nodules | | | | |
| Rock Salt | | | | |
| Salt from Brine | | | | |
| Salt contained in Brine and used for other purposes than Salt-making. | | | | |
| Slate | | | | |
| Tin Ore | | | | |
| Zinc Ore | | | | |
| Other Minerals, *viz.*:— | | | | |
| | | | | |
| | | | | |

If the mineral contains gold or silver, state the number of ounces per statute ton of ore.

Signed_____

_____ day of _____ 189 .

RETURN REQUIRED for PREPARING the MINERAL STATISTICS of the UNITED KINGDOM.

Address :—(*Of Inspector of Mines.*)

**Mineral Works not being Mines subject to the Coal Mines Regulation Act or the Metalliferous Mines Regulation Acts.**

*Return of Minerals for the Year ending 31st December, 189 .*

Name of Mineral Works_____

Situation of Mineral Works_____

County_____

Name of Owner or Company_____

Postal Address_____

NUMBER of PERSONS ordinarily employed during the YEAR, including DRESSERS within the boundary of the MINERAL WORKS.

| AGES 10 TO 13. | | AGES 13 TO 18. | | AGES ABOVE 18. | | TOTAL. |
|---|---|---|---|---|---|---|
| Males. | Females. | Males. | Females. | Males. | Females. | |
| | | | | | | |

MINERAL DRESSED, AND UNDRESSED MINERAL SOLD, TREATED, or USED, during the Year.

| KIND OF MINERALS. | QUANTITY. | | Average Percentage of Metals. | Value at the Works of the quantity returned. |
|---|---|---|---|---|
| | Mineral Dressed. | Undressed Mineral Sold, Treated, or Used (exclusive of that which has been stocked, or from which Mineral has been dressed). | | |
| | Statute Tons. | Statute Tons. | | £ |
| Alum Shale | | | | |
| China Clay | | | | |
| Copper Ore | | | | |
| Copper Precipitate | | | | |
| Coprolites | | | | |
| Fireclay | | | | |
| Gypsum | | | | |
| Iron Ore | | | | |
| Iron Pyrites | | | | |
| Ironstone | | | | |
| Lead Ore | | | | |
| Limestone | | | | |
| Ochre | | | | |
| Phosphatic Nodules | | | | |
| Rock Salt | | | | |
| Salt from Brine | | | | |
| Salt contained in Brine and used for other purposes than Salt-making. | | | | |
| Slate | | | | |
| Stone | | | | |
| Tin Ore | | | | |
| Zinc Ore | | | | |
| Other Minerals Namely : | | | | |
| | | | | |
| | | | | |

If the mineral contains gold or silver, state the number of ounces per statute ton of ore.

## 31.—GLOSSARIES OF MINING TERMS.

The want of a glossary of Indian mining terms has been felt, and expressions of such a want have been made to me by Managers, Magistrates, and others who are brought into contact with mining people and mining work either at mines, at inquests, or in law courts. I have made an effort to meet the want by a small series of glossaries that give the terms used in some of the principal mining districts of India. I have, in the compilation, availed myself of the experience and knowledge very kindly and readily given to me by a number of experienced mining officials. It would have been possible to have given more correct spellings (as used by authorities) in many cases by making frequent references to dictionaries, and in fact an extensive glossary could, with comparative ease, have been made up in that way, but such a glossary would not have given the words in *actual use* at and in the mines. It was a glossary of words and terms in actual use that I wished to collect and arrange, believing that it is of much more importance to represent in a mining glossary the sounds of the words in actual use than any accepted form of spelling out the meaning of words as understood by educated people, without reference to their actual use at the mine, remembering that Indian mining workmen are not well educated, though such form a great majority of the mining people, and are the people that most make a glossary necessary. One of the things I kept in mind was that the masses of the people, the uneducated, use the numerous terms, terms that they believe to be part of their own languages, or modifications of those languages or of English, and they are the people that cannot give a proper explanation themselves of the terms they use. To meet the special peculiarities of the case I sought the information and got it almost directly from the mine and from the mining people, and believe that it may be of the greatest use to all who may have anything to do with Indian mining and mining people. The glossaries will also be very useful to every one who may have to formulate any mining rules, notices, orders, directions, or warnings.

# GLOSSARY OF MINING TERMS ARRANGED FROM PARTICULARS SUPPLIED BY MINE MANAGERS.

*See Index to English terms, page 279.*

| No. | Glossary of Indian Mining Terms used in Giridih, in Hindi and Khortha (Ganwary), prepared by Dr. Walter Saise, Manager, E. I. Ry, Co.'s Collieries, Giridih. | | English terms. | Warora Colliery, C. P. | | Mohpani Colliery, C. P. |
|---|---|---|---|---|---|---|
| | Mining Terms, Giridih. | | | Corresponding terms in actual use at the Warora Colliery. | Language of term used. | Corresponding (Hindi?) vernacular terms in actual use at the Mohpani Colliery. |
| 1 | Ancherà | अंचरा | Band or parting in a seam | ..... | ..... | Bich ka Patthra. |
| 2 | Awáj dená | अवाज देना | To signal | Ghanta marna | Urdu | Gûn marna. |
| 3 | Áille | आड़ी खे | To raise a little preparatory to lowering | Habbas karna | Do. | Tora avis asté. |
| 4 | Átan | आतन | Place of work | Kaman | Do. | Gudda. |
| 5 | Ári | आरी | A saw | Ari | Marathi | Aree, ara. |
| 6 | Alkatrá | अलकतरा | Coal tar | Damar | Do. | Dhammar. |
| 7 | Arandi or Rendi tel | अरंडी या रेंड़ी तेल | Castor Oil | Arandi ka tel | Urdu | Undeeka tail. |
| 8 | Arda | अरदा | Hard, solid | Sakut | Marathi | Karrah, puckka, muzboot, sakt. |
| 9 | Bálti | बालती | Bucket or tram | Loris | Urdu | Balte (bucket). Ghâree (tram). |
| 10 | Bind | बिन्द | A shot hole | Footai ka ched | Do. | Surung ka hole. |
| 11 | Bhánph | भांफ | Steam | Isteem | English | Esteam, Bahhf, Pani ka howa. |
| 12 | Bailat or Bailá | बायलट | Boiler | Bailur | Do. | Bāilar. |
| 13 | Baruj | बारुज | Gunpowder | Barud, Daroo | Marathi | Barode. |
| 14 | Bijli bakas | बिजली बक्स | Exploder | Bijli ka bakas | Urdu and English | Topee, tota ka topee. |
| 15 | Bita or jita | बिता या जीता | Magnetic iron sand | ..... | ..... | ..... |
| 16 | Bhotha loha | भाथा लोहा | Poor or blunt iron | ..... | ..... | Moondi loha. |
| 17 | Bhusbhusia pathal | भुसभुसिया पत्थर | Sandstone | Pathur, or Raitee ka pathur | Urdu | Ratila put tha. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18 | Barma | बरमा | Drill | Barma | Do. | Burma, drill, subbal. |
| 19 | Barma kál | बरमा कल | Drilling machine | Barma ki kal | Do. | Goormet. |
| 20 | Bachne ká jagah | बचने का जगह | Refuge hole | ..... | ..... | Bachana ka jugga, hōle, gudda. |
| 21 | Bhatthá | भट्टा | Kiln or oven | Bhuttee | Urdu | Bhutthi. |
| 22 | Belati Bhattha | बिलाती भट्टा | English coke oven | ..... | ..... | ..... |
| 23 | Bamba | बम्बा | Boring sludger; pump | Borin ka Burma | English and Urdu | Pump. |
| 24 | Basulá | बसुला | Carpenter's adze | Basula | Urdu and Marathi | Basoola. |
| 25 | Broosh | बुरुस | Paint brush | Broosh | English | Rung poatna. |
| 26 | Balli or Banreri | बल्ली, बड़ेंडी | Middle beam of the house | ..... | ..... | Barairee. |
| 27 | Bigin Brass | बिगिन ब्रास | Bigend brass | Bigun ka brass | English and Urdu | Bigend brass, crauh brus. |
| 28 | Bardo | बरदी | Carpenter's brace | ..... | ..... | Burma. |
| 29 | Bhathi | भाथी | Smith's bellows | Dhummun Dhauwukni | Urdu | Dhōknee. |
| 30 | Bheá nak jagah | भयानक जगह | Dangerous place | Kharab jagah | Do. | Karāb jugga, Khâuf nâk jugga, Dayshat ka jugga. See also Nos. 150 and 181. |
| 31 | Bilati inta | बिलाती ईंटा | Fire-brick | Phire brick | English | Pătthra ka eent. |
| 32 | Bilati mati | बिलाती माटी | Fire-clay | Khadan ki mutti | Urdu | Gārâ. |
| 33 | Bagal | बगल | Side of road | Bagal and Dewal | Do. | Rasta ka kaggar, Kânârâ. |
| 34 | Baloo or Bali | बालूया बाली | Sand | Raitee | Do. | Raita. |
| 35 | Barooj khána | बारुज खाना | Powder magazine | Baroot khana or maigzeen | Do. | Barode khana. |
| 36 | Chának | चानक | Pit bottom, or top, or any place where flat sheets are laid and tubs are turned | (*a*) Pit top-Theeya<br>(*b*) „ bottom-Goolaee. | Do. | Thier, Tier. |

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| 37 | Chál | चाल | Roof (in pit) | Chat | Marathi | Chandi (roof in pit). |
| 38 | Chhánt | छांट | Roof (in house) | ..... | ..... | Chăppa, chăt (roof in house). |
| 39 | Chhed | छेद | A hole | Ched, or Bhoke | Urdu and Marathi | Chaid. |
| 40 | Chándni | चांदनी | Goaf | Ruddee kawan | Do. do. | Raddi jugga. |
| 41 | Cháp koela | चाप कोयला | Large coal | Bara kolsa | Marathi | Burra quaila. |
| 42 | Chhai | छाय | Ashes | Rakhur | Do. | Râkh. |
| 43 | Chirág | चिराग | Earthen-ware lamp for heavy oils | ..... | ..... | Dyah. |
| 44 | Charka pathal | चरका पत्थल | White sandstone | Safed Bhurbhoora Pathur | Urdu | Safaid rataila putthra. |
| 45 | Cháljhára | चाल झारा | Roof examiner | ..... | ..... | Chandi toknawallah, chandi deknawallah. |
| 46 | Chikni | चिकनी | A slickenside | ..... | ..... | Phŏorŏot. |
| 47 | Chánr | चांड़ | Water bailing basket | (Leather bucket) Dool<br>(Bucket) Bálti | Urdu<br>Marathi | .....<br>..... |
| 48 | Chongá | चींगा | A cartridge made to receive powder | Thailee | Hindi | Cartouche, Totar. |
| 49 | Chadrá | छाद्रा | Flat sheet (of iron) | Lohai ki chaddur | Urdu | Lohar ke chăddâh. |
| 50 | Coolie | कुली | Labourer | Kooli, Muzdoor | Urdu and English | Coolie, Kamwallah, Măhintee. |
| 51 | Chip | चिप | Boring rod | Burma | Urdu | Burma, burma ka chărr, burma ka rod. |
| 52 | Chalnà | चलना | Screen | Channi | Do. | Chănnâh. |

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|---|---|---|---|---|---|---|
| 53 | Crán . . . | क्रान . . . | Crabwinch or crane . . . | Gireme . . . . | Do. . . . | Ginnie (G. hard). |
| 54 | Chounki, kursi . | चौंकी, कुरसी . . | Wood office chair . . . | Kursi . . . . | Urdu and Marathi . | Koorsee. |
| 55 | Chaprás . . | चपरास . . . | Badge . . . . . | Chapras . . . | Do. do. . | Chuprâse. |
| 56 | Cheni . . . | चीनी . . . | Ladder . . . . . | Nishani or Sirhi . . | Marathi and Urdu . | Naseenee. |
| 57 | Charka . . | चरका . . . | White . . . . . | Safed . . . . | Urdu . . . | Safaid. |
| 58 | Chántá hai . . | चांताहै . . . | Pressing or squeezing . . . | Dabana . . . . | Do. . . . | Dâbnâ. |
| 59 | Chhánt karta hai . | छांट करता है . . | Dressing or cutting sides of road or shaft . . . . . | Daresi Karna . . | English and Urdu . | Chătnâ, chătai kărna. |
| 60 | Chheni . . | छेनी . . . | Chisel . . . . . | Chheni . . . . | Urdu . . . | Rukâni, cheemie; Boring chisel = cuttle. |
| 61 | Daik . . . | डाइक . . . | Trap or trap-dyke . . . | ..... | ... .. | Tailiya kâlâr putthra. |
| 62 | Dibia . . . | डिबिया . . . | Tin lamps or light oil . . . | Dibi or Bulti . . . | ..... | Charagh. |
| 63 | Dhunwán . . | धूँवां . . . | Smoke . . . . . | Dhuán . . . . | Urdu . . . | Duâr. |
| 64 | Daram . . | दरम . . . | Drum . . . . . | Run Bailum . . . | Do. . . . | Bâlen. |
| 65 | Daina mati . . | दैना माटी . . | Dynamite . . . . . | ..... | ..... | Bâlayti tota. |
| 66 | Dibia . . . | डिबिया . . . | A scraper for cleaning out shot holes . . . . . | Seenk . . . . | English . . | Ēstraf; Beater = Darustna. |
| 67 | Dhiria . . . | धिरिया कोयला . . | Stony coal . . . . . | Pathur ka koela . . | Urdu . . . | Kikarriah; Splint coal = Kapariah. |
| 68 | Dukan . . . | दूकान . . . | Shop . . . . . | Dookan . . . . | Do. . . . | Dookân; Workshop = Karkana. |
| 69 | Dánt . . . | दांत . . . | Tooth . . . . . | Dánt . . . . | Do. . . . | Dât. |
| 70 | Dánt charkha . | दांत चरखा . . | Toothed wheel . . . . | Dánt ka chukka . . | Do. . . . | Dâtwallah chark. |
| 71 | Dákni Engine . | डाकनी इञ्जिन . . | Donkey Engine . . . . | Donkin . . . | English . . | Donkey. |

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| 72 | Dooli or khatoli | दौली, खटौली | Stretcher | Seek Palung | Urdu and Marathi. | Palanh, charpoy, Cotiah. |
| 73 | Dabhna | डभना | Steam coal above 3 inches cube | ..... | .. | ..... |
| 74 | Dhenki | ढेंकी | Lever | Hundal | English | Singărâ; Boring lever = Gumanee. |
| 75 | Dahar | डहर | Road | Rasta, Sarak | Marathi | Rasta, Surrăh, gail. |
| 76 | Dewal | देवाल | Side of a shaft or gallery | Dewal | Urdu | Dewâll. |
| 77 | Dhál | ढाल | Dip (of seam or bed) | Salamee | Do. | Salami. |
| 78 | Dháp | धाप | Offset in pit on which brick-work is built | Kuska | Do. | Kotee ka jugga. |
| 79 | Dhamka | धमका | Cracked or broken | Toota hua | Do. | Dhărâge, phatgya, tootgya. |
| 80 | Ek par habis | एक पर हाबिस | To raise a little preparatory to raising | Thora habbas karo | Do. | Tora avis asté. |
| 81 | Eláká | इलाका | District | Jagah | Do. | Zilla; a district in the mine is called "District." |
| 82 | Fátak or Phatak | फाटक | A gate or door | Phatak | Marathi | Phâtuk, dărwâzâ. |
| 83 | Fátak wala | फाटक वाला | Door boy | Phatak wala | Do. | Phâtăkwallah. |
| 84 | Fát jana or Phat jana | फाट जाना | To crack | Phutjana | Urdu | Dharaj karna, tont karna. |
| 85 | Fát gaya | फाट गाया | Cracked or broken | Phutgaya, or Tootgaya | Do. | Dharaj, toota, phoota. |
| 86 | Fáltu | फालतु | Fault | Sundoo | Marathi | Dâm. |
| 87 | Gari | गाड़ी | Tub or Tram | Loris | Urdu | Gharri. |

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|---|---|---|---|---|---|---|
| 88 | Gherá | घेरा | Fence | Bans | Do. | Bâri. |
| 89 | Gainti | गैंती | A collier's pick | Pickas | Marathi | Gaintee. |
| 90 | Gherá lagana | घेरा लगाना | To fence or brattice | Pardah | Urdu | Band karna, kenche ka lakhri lagana; Purdah-brattice. |
| 91 | Gachh | गाछ | Height of seam or thickness of coal | Unchan, or motan koelai ki | Do. | Quaila ka unchai; quaila ka motai. |
| 92 | Gulwa pakal | गुलवा पकल | Conglomerate | ..... | ..... | Gota patthra; jamade patthra. |
| 93 | Ghantà | घंटा | Signal | Ghanta | Marathi | Singâl, gŭnta, gun. |
| 94 | Ghirin chakà | घिरीन चाका | Self-acting incline | ..... | ..... | Incline; ginnie (G. hard). (English). |
| 95 | Ghirni | घिरनी | A pulley | Ghirnee | Urdu | Chaarrk. |
| 96 | Gári aur ra | गाड़ी और राइ | Tubs and clearance | ..... | ..... | Ghari; bachan Bajoo=clearance. |
| 97 | Geruà pakal | गेरुआ पकल | Red, dark, or hard stone, ferruginous sandstone | Lall, or kala pathur | Urdu | Lal, kalar, karra lohar ka patthra; dhow. |
| 98 | Gári mán | गाड़ीमान | Putter, carter | Lorris wala | Do. | Dakailna wallah, gharri wallah. |
| 99 | Ghori | घोड़ी | Wooden stand or horse | Teepaee | Do. | Teepoy. |
| 100 | Ghan | घान | Blacksmith's hammer | Hatowree, or Hatowra | Marathi | Burra Gŭn. |
| 101 | Gumti | गुमटी | Point-box or hut | Sanda ki Jhonpri, or Gheer | Urdu | Chokee. |
| 102 | Gulwa | गुलवा | A large pebble or boulder | Sagar Gota, or Gotee | Marathi | Goota. |
| 103 | Gaj or Gaz | गज,गज़ | Two-foot rule or measuring instrument also a yard measurer; a rod a ramrod. | Gaj, or Gaz | English (?) | Gudj. |
| 104 | Hawa | हवा | Air | Hawa | Urdu | Howa. |
| 105 | Haudà | हौदा | Sump | Pani ki nalli | Do. | Howdee. |
| 106 | Hawa soom | हवासूम | Air gallery | Hawa ki kaman | Do. | Howa ka rusta. |
| 107 | Hawa pipe | हवापाइप | Air pipe | Hawa ki pipe or nul | Do. | Howa ka pipe. |

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| 108 | Hawa kal | हवा कल | Fan | Pankha | Urdu and Marathi | Punkah, howa punkah. |
| 109 | Habis karná | हाविस करना | To raise | Habbis karna | Do. | Avis karna. |
| 110 | Hoodar ká rassá | हूदर का रस्सा | Guy rope | Guy ki rassi | Marathi. | Tanka russee. |
| 111 | Hathouri | हथौड़ी | Hammer | Hatowra or Hatowree | Urdu | Martol, hatowra. |
| 112 | Hath kránt | हथ क्रान्त | Hand saw | Arj | Marathi | Atee. |
| 113 | Hath bambá | हथ बंबा | Hand pump | Hath doukni | Marathi and English | Ginnie (G. hard). |
| 114 | Intá | ईंटा | Brick | Eent | Urdu. | Eent. |
| 115 | Indárá | इन्दारा | Shaft or pit | Khadan | Urdu and Marathi | Kooa (same as well). |
| 116 | Ispát ka rassa | इस्पात का रस्सा | Rope, steel | Tar russee | Urdu | Espât ka Tar. |
| 117 | Intá ká farmá | ईंटा का फरमा | Brick mould | Eent ka phurma | Do. | Sancha. |
| 118 | Jatri | जातरी | A frame or durnze or setting of timber. | ..... | ..... | Jura; pair lakhri. |
| 119 | Jhámá or Jhowán | झामा | Burnt or melted stone | ..... | ..... | Jăllâ patthra. |
| 120 | Jám páli | जाम पाली | Fixed valve or clack valve | Valve | English | Same as in English. |
| 121 | Jigrel | जिगरेल | Self-acting incline | ..... | ..... | Incline, ginnie (G. hard). |
| 122 | Jartáhi koelá | जराठी कोयला | Burnt coal | Jula hua kolsa | Urdu and Marathi | Jăllâ quaila. |
| 123 | Juwali | जुवाली | Boring tiller | ..... | ..... | Gumâne. |
| 124 | Jarib | जरीब | Measuring chain | Jareeb | Urdu | Jareeb. |
| 125 | Jani or Jeni | जनी, जिनी | Woman | Baiku aurut | Marathi and Urdu | Aurăt. |

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|---|---|---|---|---|---|---|
| 126 | Jám | जाम | Sprag | Dusta | Urdu | Jâm. |
| 127 | Jhandi | झन्डी | Flag | Jhundee | Marathi | Jindee. |
| 128 | Jorá | जोड़ा | Pair | Jora | Urdu | Jura. |
| 129 | Jhori | झोरी | Basket | Dala, or Dullya Cheebie tokni. | Do. | Tokni, bowiya. |
| 130 | Juridár | जोड़ीदार | Mate | Mate, or Mokadum | English and Urdu | Mate or muccadam, (makadam). |
| 131 | Khád | खाद | Mine | Khadan | Urdu and Marathi | Kădâm. |
| 132 | Khatam | खतम | Face of gallery | Kaman | Urdu | Gudda. |
| 133 | Koelá | कोयला | Coal | Kolsa, or koela | Marathi and Urdu | Quaila. |
| 134 | Kerasin | करासिन | Crossing | Crossing | English | The same as in English. |
| 135 | Kámin | कामीन | A working woman | Raiza | Urdu | Kamwallah aurăt. |
| 136 | Kánti kátná | कांती काटना | To cut pillars or work in the broken | Paya ka kam chalana | Do. | Pya tootna ka kam. |
| 137 | Kirijá ghar | कीरीजा घर | Ventilating furance | Hawa ki Jagah, or chimney | Urdu and English | Howa ka sigree. |
| 138 | Kirij | कीरीज | A rake for stirring fire | Sink | English (?) | Hook. |
| 139 | Karua pakal | करुआ पकल | Black sandstone | Kala pathur | Urdu | Kala rataila patthra. |
| 140 | Khooti | खूटी | Prop | Dant | Do. | Prop, lachri, lakrí. |
| 141 | Khád ká tatoo | खाद का टटू | Pit pony | Khadan kai tuttoo | Do. | Ghora. |
| 142 | Kaida | कायदा | Rule | Gaj | English (?) | Hookm, Kaida. |
| 143 | Kal | कल | An engine | Ungun | Do. | Engine (as in English). |
| 144 | Khanjá | खंजा | Nick, under-cut, grove | Nulliyah | Urdu | Nalee katna. |
| 145 | Koniá | कोनिया | Wedge | Packing gootka | English and Urdu | Patcharria takee, patcha. |

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| 146 | Kamchá | कमचा | Shovel | Chummuch | Urdu. | Belcher. |
| 147 | Koni | कोनी | Wedge | Funnee | Do. | Takee. |
| 148 | Kháti | खाती | Gangs of miners | ..... | ..... | Duffai. |
| 149 | Kajá eláhi | कजा इलाही | Accident | Chot, or mar | Urdu. | Dhokha, dhokhase. |
| 150 | Kharáb Jagah | खराब जगह | Dangerous place | Kharab jagah | Do. | See Nos. 30 and 181. |
| 151 | Khep | खेप | Trip or journey | ..... | ..... | Cāpe. |
| 152 | Khilán | खीलान | Arch | Kaman-dát | Urdu | Dânt. |
| 153 | Kudálí | कुदाली | Shovel (a kind of pick-axe) | ..... | ..... | ..... |
| 154 | Kharbhoosiá | खरभूसिया | Incompletely burnt coke | ..... | ..... | ..... |
| 155 | Kádo | कादो | Clay | Khadan ki mutti, chiknee mutti. | Urdu | Chickna Mutty. |
| 156 | Kánti | कांती | Pillar | Paya | Do. | Pya. |
| 157 | Kole katta | कोल कट्टा | Coal cutter | Pickawala | Urdu and Marathi. | ..... |
| 158 | Karkháná dukán | कारखाना दुकान | Workshop | Karkhana | Urdu. | Karkhana. |
| 159 | Káth | काठ | Timber | Lakri | Do. | Lakhri. |
| 160 | Kewári | केवाड़ी | Wood door | Lakri ka darwaza | Urdu and Marathi. | Phatuk. |
| 161 | Kamri gaj | कमरीगज | Rail gauge | Rail Gaj | English and Urdu. | Gudj, rale ka gudj. |
| 162 | Kánti | कांटी | Nail | Keela | Urdu | Keela. |
| 163 | Khaprá | खपटा | Tile | Kawailoo | Do. | Narayal, Kūpra. |

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|---|---|---|---|---|---|---|
| 164 | Koelá ka rassi . | कोयला का रस्सी . | Leader of coal in a fault . . | ..... | ..... | Nishani. |
| 165 | Lole Dena . . | लोल देना . . | To lower . . . . . | Neech karna . . . | Urdu . . . | Areah. |
| 166 | Loos . . . | लूस . . . | Capel or capping on rope . . | Hoze . . . . | English . . | Esocket. |
| 167 | Loh langar . . | लोहलंगर . . | Drag used on inclines to prevent set running back in case of rope breaking. (See also No. 199.) | Kutta . . . | Urdu . . . | Kuttah. |
| 168 | Lakri . . . | लकड़ी . . . | Timber . . . . . | Lakra, or lakri . . | Do. . . . | Lakhri. |
| 169 | Lingletor . . | लिंगलेटर . . | Regulator . . . . . | Regulator . . . | English . . | Regulator, "esteam cock" |
| 170 | Lát fáram . . | लाट फ़ारम . . | Wharf or platform . . . | Chowtra . . . | Marathi . . | Estation, Tier. |
| 171 | Loset gari . . | लोसेट गाड़ी . . | Lowsided wagon . . . | Low-sided wagon . . | English . . | ..... |
| 172 | Mez or Mech . | मेज़, मेच . . | Table . . . . . | Maij . . . . . | Urdu . . | Mez. |
| 173 | Maila . . . | मैला . . . | Small coal . . . . | Chota, or Bareek kolsa . | Urdu and Marathi . | Bâllâst. |
| 174 | Mulsoom . . | मूलसूम . . . | Main gallery . . . . | Seedh kaman . . | Urdu . . . | Cedar rusta = main headway. |
| 175 | Mur . . . | मीड़ . . . | Leading pillar or pillar where two goaves meet; also a stump, stook, or knob left in goaf. | ..... | ..... | Estook = stook; no term for closing lift). |
| 176 | Morhan . . | मीढ़ान . . . | | | | |
| 177 | Málkatta . . | माल कट्टा . . | Coal cutter . . . . | Pickaswalla . . . | Urdu and Marathi . | Kodaya. |
| 178 | Maila kámin | मैला कामिन . . | Dust woman . . . . | Mehtranee . . . | Urdu . . . | ..... |
| 179 | Martole . . | मारतोल . . | Hammer . . . . . | Hatora . . . . | Marathi . . | Martol, hatowra. |
| 180 | Munish balti . . | मुनिस बालती . . | Bucket with men riding . . | Peepa . . . . | Do . . | Balti. |
| 181 | Maroobhoom . | मरूभूम . . | Dangerous place . . . | Kharab jagah . . . | Urdu . . . | See Nos. 30 and 150. |
| 182 | Munis . . . | मुनिस . . . | Miner . . . . . | Khadanwala . . . | Do. . . . | Kadanwallah. |
| 183 | Mistree . . | मिसतिरी . . | Mechanic . . . . . | Fitter, or Engineer . . | English . . | Fitter lōg Karéegar. |
| 184 | Machán . . | मचान . . . | Scaffold . . . . . | Par machan . . . | Urdu . . . | Tier, Marwar. |

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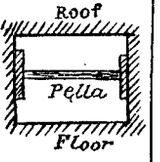
| | Mining Terms, Giridih. | | | Corresponding terms used at the Warora Colliery. | Language of terms used. | Corresponding (Hindi ?) terms in actual use at the Mohpani Colliery. |
| 185 | Meherewa pakal . | मेहेरेवा पकल . . | Fine grained stone . . . | ..... | ..... | Mahĭn patthra. |
| 186 | Morabba karassà . | मोरब्बा का रस्सा . | Hemp rope . . . . | Umbariki russa . . | Urdu . . . | Sŭn ka russa. |
| 187 | Mati kà tel . . | माटी का तेल . . . | Kerosine oil . . . . | Mitti ka tel . . . | Do. . . . | Mutty ka Tél. |
| 188 | Motarewa pakal . | मोतारेवा पकल . . | Coarse grained stone . . . | ..... | ..... | Mota patthra. |
| 189 | Narma pakhal . | नरमा पकल . . | Soft stone . . . . . | Naram pathur . . | Urdu . . . | Lurrum patthra. |
| 190 | Nehai . . . | नेहाय . . . | Anvil . . . . . | Nehaee . . . . | Do. . . . | Nahai. |
| 191 | Namoona coke . | नमूना कोक . . | First class or foundry coke . . | Ungraizi koke . . | English . . | ..... |
| 192 | Namoona . . | नमूना . . . | Sample . . . . . | Namoona . . . | Urdu . . . | Pharma, nemōna. |
| 193 | Nisaini . . | निसेनी . . . | Wood ladder . . . . | Nishanee or Zeena . . | Marathi and Urdu . | Nasseni. |
| 194 | Oat . . | ओट . . . | Sprag . . . . . | Dusta . . . . | Do. . . | Jâm. |
| 195 | Olan suta . . | ओलन सूता . . | Plumbob and line . . . | Doree and Oolumna . | Do. . . | Sowal. |
| 196 | Olan . . . | ओलन . . . | Plumbob . . . . . | Oolumna-Oorumba . . | Do. . . | Ditto. |
| 197 | Piján . . . | पीजान . . . | Small shop where miners go to sharpen their tools. | Dookan bhutti . . | Marathi . . | Dhōkân. |
| 198 | Pellá . . . | पेला . . . | A stretcher (or prop set from one side of the gallery to the other to keep the sides from falling).   | Ara . . . . | Marathi and Urdu . | Tân ka lakhri. |
| 199 | Pahalwán . . | पहलवान . . | Safety drag on end of set of tubs in inclines. (See also No. 167.) | Kutta . . . . | Urdu . . . | Kuttah. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 200 | *Phitá* . . . | फीता . . . | *Measuring tape* . . . . | *Tape or feetah* . . | *English and Urdu* . | *Pheetah, tape gudj* |
| 201 | Pumpu kà gland . | पंपू का गलांड . | Pump gland . . . . | Gland . . . . | English . . | Glan. |
| 202 | Pipá . . . | पीपा . . . | Hogshead or Barrel . . . | Peepa . . . . | Marathi . . | Peepa. |
| 203 | Phooli chaká . | फूली चाका . . | Pit-head wheel . . . . | Khadan ki russi ka chakka | Urdu . . . | Tier ka chaark. |
| 204 | Para batám . . | पारा बटाम . . | Spirit level . . . . . | { Rafeelee botul . . / Para batam . . . } | Do. . . . | Pinsâl. |
| 205 | Páyá . . . | पाया . . . | Pillar . . . . . | Payah . . . . | Do. . . . | Pya. |
| 206 | Paprá . . . | पपरा . . . | Thin scales of stone or shale . | Theeya . . . | Do. . . . | Phoortrilla patthra, purdah ka patthra. |
| 207 | Pitár frem . . | पितर फ्रेम . . | Pit-head frame . . . . | ..... | ..... | Tier ka lakhri, tier ka frame. |
| 208 | Patraddá . . | पटरद्दा . . | Cleat or face . . . . | ..... | ..... | Phŏrŏot. |
| 209 | Pattá . . . | पट्टा . . . | A lid or cap piece on a prop. | Packin . . . | English . . | Patcha, chota patia. |
| 210 | Pait . . . | पैट . . . | Point on tramway | Sandha and crossing . | Marathi and English. | Sanda. |
| 211 | Páli . . . | पाली . . . | Valve (in bucket) | Valve bucket . . | English . . | Valve, clack. |
| 212 | Páni . . . | पानी . . . | Water . . . . . | Panee . . . | Marathi . . | Pani. |
| 213 | Páni mar gyá . | पानी मर गया . . | Water out or lowered . . . | Panee khalas hona or kam hona. | Urdu . . . | Pani kalas, pani kutch kalas. |
| 214 | Pánkhoolká . . | पन खुलका . . | Water bailers . . . . | Pani nikalne wala . . | Do. . . . | Pani wallas. |
| 215 | Pathar or pakal . | पथर, पकल . . | Stone . . . . . | Putthar . . . | Do. . . . | Patthra. |
| 216 | Pinjrá . . . | पिंजरा . . . | Cage . . . . . | Peepa . . . . | Marathi . . | Pinjara. |
| 217 | Pák . . . | पाक . . . | Turn on a drum . . . . | ..... | ..... | Ēk hapāit. |
| 218 | Phookará . . | फुंहकरा . . | Cross cut gallery . . . . | Cross cut kaman . . | English and Urdu . | Cross cut as in English. |
| 219 | Pardá . . . | परदा . . . | Stopping . . . . . | Dewal . . . . | Urdu . . . | Estopping, dewâll. |
| 220 | Pári . . . | पारी . . . | A shift or term of duty . . . | Budlee . . . . | Do. . . . | Pahrie. |
| 221 | Pokharia . . | पोखरिया . . | A quarry or open work . . | Khadan or putthur khadan | Do. . . . | Patthra kadan. |

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| 222 | Phul koelá | फूलकोयला | Soft coal | Narum koela or kolsa | Urdu | Larm quaila, narm quaila. |
| 223 | Patharia koela | पथरिया कोयला | Stony coal | Putthur koela or sukkut kolsa. | Urdu and Marathi | Kikarriah. |
| 224 | Phorà balti | फोड़ा बाखती | Bucket or trams of coal so loaded that coal is not packed well together. | Bharahua Loris | Urdu | Phōlee gharri. |
| 225 | Phootkará | फुटकरा | Footage | ..... | ..... | Nâpāi. |
| 226 | Rásta | रास्ता | Road | Rasta, sarak | Marathi | Rusta. |
| 227 | Rassá | रस्सा | Rope | Bussa or russee | Urdu | Russa. |
| 228 | Rel | रेल | Rail | Role | English | Role. |
| 229 | Raddá | रद्दा | Bed | Rudda-Thur | Urdu | Palank. (Palang, Charpai, Khát). |
| 230 | Rah | राह | Road | Rasta, sarak | Marathi | Role. |
| 231 | Rail khallásee | रेल खलासी | Rail layer | Rafeelee wala | Urdu | Rolewallah. |
| 232 | Rinjek | रिंजक | Injector | Injector | English | Injector (as in English). |
| 233 | Reti | रेती | File (when tool); also coarse sand | Raitee sohun | Urdu | Raytee; sand = Rayta. |
| 234 | Renchoo | रेनचू | Spanner | ..... | ..... | Espanner. |
| 235 | ..... | ..... | Chisel | ..... | ..... | Chinee, rukani, cuttle. |
| 236 | Rookàni | रुखानी | Chisel, firmer, flat | ..... | ..... | Puckha, bărâbar. |
| 237 | Rassi | रस्सी | String | ..... | ..... | Rusee, sootlee. (Rassí, Sutlí). |
| 238 | Sulphi | सुलफी | A pricker and bunter for sounding roofs and pulling down loose coal and stone in high places. | ..... | ..... | Latlih. (Use a ladder in this mine). |
| 239 | Soom | सूम | Gallery | ..... | ..... | Gudda. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 240 | Sirhi | सीढी | Floor | ..... | ..... | Zamin. |
| 241 | Silpat | सिलपट | Sleeper | ..... | ..... | Sleepat, patia. |
| 242 | Sooroong | सुरंग | A charged shot-hole | ..... | ..... | Surung. |
| 243 | Sábel | साबल | A drill or crowbar or jumper | ..... | ..... | Drill, burma, subbal. |
| 244 | Sakat pakal | सकत पकल | Hard stone | ..... | ..... | Karra patthra. |
| 245 | Sini | सीनी | Slip | ..... | ..... | Purroot. |
| 246 | Sirhi mohun | सीढ़ी मोहन | Incline or adit mouth | ..... | ..... | Incline, Bogda, moorah. |
| 247 | Sil | सिल | Iron ore of any kind | ..... | ..... | Dhow. |
| 248 | Sirdar | सरदार | A native overman | ..... | ..... | Overmeen, mukadam. |
| 249 | Siti dena | सीटी देना | To whistle | ..... | ..... | Seeti dena. |
| 250 | Sarsi | सड़सी | Tongs, blacksmith | ..... | ..... | Sansee, chameeta. |
| 251 | Sulsi | सुलसी | Bunter. See Sulphi | ..... | ..... | Lattih. |
| 252 | Santri | संतरी | Eccentric | ..... | ..... | Centric. |
| 253 | Shisà or ainà | शीसा और आईना | Glass | ..... | ..... | Cânch. |
| 254 | Silli | सिल्ली | Sleeper | ..... | ..... | Sleepat, patia. |
| 255 | Sikar | सीकड़ | Chain | ..... | ..... | Gingere (G. soft), Sakăl. |
| 256 | Simanà | सीमाना | Boundary | ..... | ..... | Mehr, surood, hadd. |
| 257 | Sar-had | सरहद | Do. | ..... | ..... | Seema. |
| 258 | Simit mati | सीमेंट माटी | Cement, Portland | ..... | ..... | Belayti chūnar. |
| 259 | Tiplat | टिपलट | Tippler | ..... | ..... | Pinjara. |
| 260 | Tharraddá | ठढ़रद्दा | End of cleat or grain of coal, headways (Northumberland). | ..... | ..... | Karra Purroot; Budways-Ceda purrcot. |
| 261 | Thambh | थम्भ | Pillar | ..... | ..... | Pya. |

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| 262 | Theki . . | ठेकी . . . | Prop . . . . . | ..... | ..... | Lakhri; (khurri khurri). |
| 263 | Tattoo . . | टट्टू . . . | Pony . . . . . | ..... | ..... | Ghora. |
| 264 | Topi . . . | टोपी . . . | Percussion cap and detonator . | ..... | ..... | Tota ka topee. |
| 265 | Tontá . . | टोंटा . . . | Cartridge . . . . . | ..... | ..... | Cartouche. |
| 266 | Tharra koela . | ठर्रा कोयला . . | Hard coal . . . . . | ..... | ..... | Karra quaila, sakt quaila. |
| 267 | Tauna . . | टौना . . . | Lid . . . . . | ..... | ..... | Patcha, patia. |
| 268 | Tanki . . . | टांकी . . . | Sharp pointed wedge . . . | ..... | ..... | Takee. |
| 269 | Tesun . . | टेसन . . . | Station . . . . . | ..... | ..... | Estation. |
| 270 | Tin kà chadrà . | टिन का चदरा . | Tin sheet, corrugated . . . | ..... | ..... | Chhaddar. |
| 271 | Taktá . . . | तकता . . . | Plank . . . . . | ..... | ..... | Pattia, Takta. |
| 272 | Tijal . . . | तीजल . . . | Boring chisel. . . . . | ..... | ..... | Cuttle. |
| 273 | Táli . . . | ट्टाली . . . | Trolly . . . . . | ..... | ..... | Tailla. |
| 274 | Tokri . . . | टोकरी . . . | Basket . . . . . | ..... | ..... | Tokni. |
| 275 | Thcherá . . | ठेड़ा . . . | Boundary pillar . . . . | ..... | ..... | Mehr ka pya, mănârâ. |
| 276 | Tikas . . . | टीकस . . . | Ticket . . . . . | ..... | ..... | Ticktā. |
| 277 | Ulti baje . . | उलटी बजे . . | After-noon . . . . . | ..... | ..... | Dupair ka bad. |
| 278 | ..... | सबेरे . . . | Morning . . . . . | ..... | ..... | Soobera. |
| 279 | ..... | संध्या . . . | Evening . . . . . | ..... | ..... | Sâmko, sandya. |
| 280 | ..... | दुपहारा . . | Noon . . . . . | ..... | ..... | Dupair. |

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Rule (two-foot rule, also a yard measure, a rod, a ramrod) . . . 103
Rule (a regulation) . . 142

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Sand . . . . 34
„ (magnetic iron-sand) 15
Sandstone (white) . . 17
„ „ . 44
Sandstone (black) . 139
„ (fine grained) . 185
„ (coarse) . . 188
Saw (a saw) . . . 5
„ (a hand saw) . . 112
Scaffold . . . 184
Screen . . . 52
Scraper (for cleaning out shot holes) . . . 66
Seam (height of seam, or thickness of coal) . . 91
Shaft or pit . . . 115
Shift (as shift or turn of duty) . . . . 220
Shop . . . . 68
Shovel . . . . 146
„ . . . . 153
Shot (a shot hole) . . 10
„ (a charged shot hole) . . 242
Signal (to signal) . . 2
„ . . . . 93
Side of a shaft . . 76
Sleeper . . . . 241
„ . . . . 254
Slickensides . . . 46
Slip . . . . 245
Sludger (boring sludger, pump) . . . 23
Smoke . . . . 63
Smithy (small shop where miners go to sharpen their tools) . . . 197
Spanner . . . 234
Spirit level . . . 204
Sprag . . . . 126
„ . . . . 194
Stand (wooden stand, or horse) . . . . 99
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Stone (red, dark or hard stone, ferruginous sandstone) . . . . 97

S—*contd.*

Stone (burnt or melted stone) . . . 119
„ (hard stone) . . 244
Soft stone . . . 189
Stone (thin scales of stone, shale) . . . 206
Stopping . . . 219
Stretcher . . . 72
„ (a stretcher or prop set from one side of the gallery to the other to keep the sides from falling) . . . 198
String . . . . 237
Sump . . . . 105

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Table . . . . 172
Tar (coal tar) . . . 6
Timber . . . . 159
„ . . . . 168
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Ticket . . . . 276
Tippler . . . . 259
Tooth . . . . 69

Tongs (blacksmith's tongs) 250
Tram (bucket or tram) . 9
Trams (bucket or trams of coal so loaded that coal is not packed together) 224
Tub or tram . . . 87
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Tubs and clearance . 96

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Undercut (nick, undercut) 144

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Valve (fixed valve, or clack valve) . . 120

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Wagon (lowsided wagon) 171
Water . . . . 212
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Wedge . . . . 145
„ . . . . 147
„ (sharp pointed wedge) . . 268
Wheel (pit-head wheel) . 203
„ (toothed wheel) . 70
White . . . . 57
Whistle (to whistle) . . 249
Woman . . . 125
„ (a working woman) 135
„ (dust woman) . 178
Workshop . . . 158

# GLOSSARY OF TERMS IN ACTUAL USE AT THE UMARIA COLLIERY, CENTRAL PROVINCES.

| English terms. | Corresponding Vernacular terms. | English terms. | Corresponding Vernacular terms. | English terms. | Corresponding Vernacular terms. | English terms. | Corresponding Vernacular terms. |
|---|---|---|---|---|---|---|---|
| 1. Axe | Koolhari. | 18. Friction roller | Balin. | 34. Pump, steam, of "common" type | Donkin, | 50. Slicken sides | Chikna puther. |
| 2. Bar | Ara. | 19. Goaf edge | Morah. | 35. Pump, feed, pump of ram type | Do. | 51. Timber tram | Taila, hornytram. |
| 3. Bord | Kaman. | 20. Gallery, main | Sidha kaman. | 36. Pick-axe | Gainti, Picarse. | 52. Ventilating fan | Punkah. |
| 4. Basket | Tokri-Chibbi. | 21. „ ride drive off a main gallery | Ari kaman. | 37. Powder | Barût. | 53. Working-place in whole | Kaman. |
| 5. Bell (ordinary) | Gunta. | 22. Head-tree, or cap | Packin. | 38. Punch prop | Punch. | 54. Working-place in broken | Piar Kaman. |
| 6. „ (electric) | Bijli ka gunta. | 23. Hammer (hand) | Mortole hathori. | 39. Pick shaft | Dusta. | 55. Working-place on rise | Uper Kaman. |
| 7. Bottom coal | Furush. | 24. „ (sledge) | Gun. | 40. Rise workings | Uper Kaman. | 56. „ „ on dip | Niche Kaman. |
| 8. Coal wagon | Dubba. | 25. Incline drift | Bôbdha. | 41. Roof | Chut. | 57. Winding rope | Tar. |
| 9. „ tram | Lorris. | 26. Jenkin | Jenkin ari kaman. | 42. Sleeper | Sleeper. | | |
| 10. Cage | Pinjrah. | 27. Lamp | Butti. | 43. Saw | Ári. | | |
| 11. Colliery | Koila ka kadan. | 28. Pit prop | Kumber. | 44. Shovel | Chummuch. | | |
| 12. Cartridge | Butti. | 29. Pillar | Piar. | 45. Scraper | Seenk. | | |
| 13. Cotton wick for a lamp | Do. | 30. Pit | Kua. | 46. Sprag | Dusta. | | |
| 14. Cross cut | Cross cut. | 31. Pit rail | Rail. | 47. Stone drift | Puther ka Kaman. | | |
| 15. Dog spike | Bint Kila. | 32. Points (permanent-way) | Sanda. | 48. Staple | Kua. | | |
| 16. Drill | Shabbal. | 33. Pump, steam, of "special" type | Cylinder. | 49. Screen | Chunni. | | |
| 17. Dip. | Nichĕ Kaman. | | | | | | |

# GLOSSARY OF MINING TERMS AND CORRESPONDING INDIAN TERMS.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. (See note at foot of page.) | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 1 | Amalgam | A mixture, or semi-chemical compound of mercury with another metal. | Punjeelogum. Punchalogum. | Tamil | Kolar Gold Field, Mysore State. |
| 2 | Air-pipes | Pipes of metal, wood, canvas, or other material that are used for conveying air. | Kathoo Koyya. Kathoo Kola. The English term is most often used. | Do. | ,, |
| 3 | A miss-fire | A failure to fire | Runjuck. Looskooly, Thuppoo Koolie. | Do. | ,, |
| 4 | A miss-fired shot. | A shot that has failed to fire | Runjuck. Cuthree Koolie | Do. | ,, |
| 5 | Air | The atmosphere | Kathoo. Gali. Compressed air is called steam | Do. Telugu | ,, ,, |
| 6 | Adlings | Earnings. Wages earned | Sambathana. Jeevanum. | Tamil | ,, |
| 7 | Arch | In metal mining, it is a cog or pillar, or piece of ground left unworked near a shaft, or in a stope, or to support a corner or large excavation. In coal mining, it is an arch built of bricks or other building material. | Kumbum | Do. | ,, |
| 8 | Axe, hatchet or dag. | This is the well known cutting and shaping instrument for timber. | Kodali | Do. | ,, |
| 9 | Adit | A nearly horizontal passage leading from the surface to the workings of a metalliferous mine, and made, principally, for a water passage to drain the mine. | ... | ... | |
| 10 | After-damp | The noxious gases formed by the explosion of firedamp. | ... | ... | |
| 11 | Air-courses | The passages of a mine used principally for the ventilating air to pass into and along the mine. It is the same as air-way, air-gate, air-heading. The passage along which the air goes into and around the mine is called the "intake," and that by which it leaves the mine working is the "return." | ... | ... | |
| 12 | Air-crossing | An air-tight bridge by which air passes over or under and at about right angles to another air-current, thus enabling two air-currents to be crossed without joining—as the return air over or under the intake air. | ... | ... | |
| 13 | Back of a lode | That part of the lode between the roof of a level and the surface. | ... | ... | |

NOTE.—The words are intended to represent the *sounds* used, and *not* any accepted form of spelling; they appear here as given to me by the mine officials.

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 14 | Backshift . | Afternoon or second shift; (also a night or third shift) of miners. | Kootum . Goomboo . | Tamil . | Kolar Gold Field, Mysore State. |
| 15 | Battery . | Synonymous with stamping mill . | Hoolakay . Idithul . Valkay . Estamper . | | |
| 16 | Branch . | A small string of ore in connexion with the main lode, or a lode leading off the main lode. | Koodee, Saray Korlee. Kode . . | Do. . | ,, |
| 17 | Backing . | Laths, planks, or other timbers put behind main timbers. | Woothamanum Cutta. Varichoo Marum Mootoo Marum | Do. . | ,, |
| 18 | Barrow . | A truck with one wheel and two handles, much used belowground in metal mining. | Ooru Sakarum Vundee . Otha Sakarum Vundee. | Do. . | ,, |
| 19 | Boiler . . | A steam boiler . . . . | Irumbo Gundoo . | Do. . | ,, |
| 20 | Blasting Gelatine. | One of the high explosives requiring a detonator to explode it; and made from nitro-glycerine, nitro-cotton, and small proportion of other materials. | Gelatine Murninthoo. Gelatine Masindoo. | Do. . | ,, |
| 21 | Basket . . | Baskets made of strips of bamboo . | Kooday . . Makaree . | Do. . | |
| 22 | Back . . | A slippery or clayey joint or smooth division in a bed of coal or hard rock, sometimes called a face. The smooth parting has often some sooty coal included in it. These "backs" are often a source of great danger. | Pashay, Pooditchay, Veddum. | Do. | , |
| 23 | Bearer or Biard | A large piece of timber used to support the engine and pumps or other machinery in or over the engine shaft. It is the name sometimes given to most supporting timbers that are horizontal or nearly so. | Soomie . . Thangee . . Thoon, Murram . | Do. | ,, |
| 24 | Bast or Hoggan | A miner's supply of food carried to the mine for eating during working hours; also called a crib, snap, jack-bit, etc. | Sapadoo . . Bajanum . . Theeni . . | Tamil . Telugu . Tamil . | ,, |
| 25 | Bricks . . | Shaped and burnt clay . . | Sankull . Sengkul . Chungal . Kalloo (stones) | Do . | ,, |
| 26 | Bank . . | The top of the shaft, or out of the shaft. The surface around the mouth of a shaft. To manipulate coals, etc., on the bank. A large heap or stack of mineral on the surface. | ... | ... | |
| 27 | Banksman . | The man in attendance at the top of the shaft to superintend the work of banking. | ... | ... | |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 28 | Bar . . | A length of timber usually fixed across a passage and placed against the roof to support it and held firmly by end supports. Iron or steel rails or girders are also sometimes used for bars. The ends are held firmly by props, or one or both ends may be fixed in solid coal or rock. | ... | ... | |
| 29 | Black-damp, Choke-damp, or stythe. | Impure carbonic acid—$CO_2$; also chemically known as carbon dioxide, and carbonic anhydride. "After-damp" is sometimes called by this name. | ... | ... | |
| 30 | Blower . | A sudden emission or outburst of firedamp in a mine. The emission, accompanied by a singing noise, of gas with water from coal and rock. | ... | ... | |
| 31 | Blown-out shot | A shot that has blown out the tamping, but not loosened the coal or rock. | ... | ... | |
| 32 | Blue cap, or Cap. | The blue halo of burning firedamp and air to be seen on the small flame of a safety lamp when testing for firedamp where it is present. | ... | ... | |
| 33 | Bonnet . | The overhead cover of a cage. The cover on a safety lamp. | ... | ... | |
| 34 | Buntons . | Timbers placed horizontally across a shaft or slope to carry the cage-guides, pump-rods, columns of pipes, etc, also to strengthen the shaft timbers. | ... | ... | |
| 35 | Cage . . | The platform and framework, or elevator used for hoisting and lowering the miners, as well as coal, ore, etc., along a mine shaft. | Koondoo . . Hirrimboo pitty | Tamil . | Kolar Gold Field, Mysore State. |
| 36 | Cam . . | A long curved tooth, or shaped wheel, fixed on a shaft for the purpose of raising a stamp; or for periodically raising engine valves, and many other things. | ... | ... | |
| 37 | Captain . | The overseer or practical manager of a metal mine, also called chief mine agent, chief underground agent, or underground foreman. He has almost full control of all underground work. | Kapootan . Thalivan . . Karriah Tharasee | English . Tamil . | „ „ |
| 38 | Casing . . | The material between a reef or lode and its walls. | ... | ... | |
| 39 | Cob or Cobbing | The bruising or breaking of ore into "cobbles" or small lumps. | Poody Kulloo . Podurayee . | Tamil . Telugu . | „ „ |
| 40 | Country rock | The rock on both sides of the lode. The wall or face on the upper side is called the hanging wall, that on the lower side is the foot wall. | Null Roy . . Karrappoo Kulloo | Do. . Tamil . | „ „ |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 41 | Corve, tub, lorrey, bucket or tram. | A small wagon used for drawing mineral underground, as well as for bringing it to the surface. | Iroomboo vundee | Tamil | Kolar Gold Field, Mysore State. |
| 42 | Cross course | A cross vein or lode | ... | ... | |
| 43 | Cross cut | A level or tunnel driven towards a lode, but at right angles, or nearly so, to its course. A thirl is a "cross cut" in coal between two main roads. | Koorookoo Soorungum<br>Koorookie Soorungune. | Tamil | ,, |
| 44 | Course of a lode. | The direction of the run of the lode. | ... | ... | |
| 45 | Crabwinch | A crane | Parencha-ampi-Winch-oonch. | Tamil | ,, |
| 46 | Capel | A capping or socket on a rope to join it with a chain or with a link. | ... | ... | |
| 47 | Chain | The iron chains used | Sainkely, Shengely.<br>Sungalee<br>Surpany<br>Chengaly | Tamil<br>Kanarese<br>Tamil | ,,<br>,,<br>,, |
| 48 | Cage guides, or conductors. | The rods of wood, iron, steel, or tightened wire ropes in a shaft that guide the cages, etc., and prevent them striking each other or the sides of the shaft. | ... | ... | |
| 49 | Cartridges | Paper, cloth, or waterproof cylindrical cases to hold explosive charges. | ... | ... | |
| 50 | Catches, keeps, keps, rests, or wings. | Moveable iron levers, props, catches or rests used to hold the cages at rest at the top and bottom of shafts or at any landing. The stops fitted on a cage to prevent the wagons running out are also called "catches." | ... | ... | |
| 51 | Chocks or nogs | Square pillars built up of a series of crossed timbers for supporting the roof of a mine. | ... | ... | |
| 52 | Dam | A barrier to keep back bad air or water; may be made of wood, bricks, stones, or mixtures of these with metals and other materials. | Annaykuttoo<br>Annie<br>Thunny thoty | Do. | ,, |
| 53 | Damp | Bad air; choke damp; fire damp, $CH_4$; carbonic anhydride, $CO_2$; and other noxious gases, sometimes including the noxious fumes from explosives. | ... | ... | |
| 54 | Dam | A tub without wheels, sometimes called a sledge. | Chuckrum hillathay thoty. | Tamil | ,, |
| 55 | Dead-ground. | Poor parts of a lode, or parts without ore. | ... | ... | |
| 56 | Deads | Earthy or worthless material, without ore, rubbish, refuse. | Karapoo kulloo<br>Nullaruyee<br>Vothoovathayveddum. | Do.<br>Telugu<br>Tamil | ,,<br>,,<br>,, |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 57 | Dip or Hade . | The angle which a lode, bed, or seam makes with the horizontal. | ... | ... | Kolar Gold Field, Mysore State. |
| 58 | Dyke . . | Intruded igneous or metamorphic rock which fills the fissures and rents in stratified rocks. | Karunkal Sarie . | Tamil . | |
| 59 | Dynamite . | It is one of the high explosives, requiring a detonator to explode it; and is made by suitably saturating an infusorial earth called "Kiesulghur." with nitroglycerine. | Vadimarunthoo . Vuddeemurrunthoo. Vadumaranthoo. Veddymurinthoo. | Do. | ,, |
| 60 | Detonator . | Small metal caps containing a little fulminate of mercury or other powerful exploding composition, and used for detonating or exploding otherwise inert explosives. | Kappuloo . . Keembooree . Kapoo . . | Do. . | ,, |
| 61 | Drill . . | A pointed iron or steel tool for making shot holes. | Irumboo gatanum. Guddiebarie . Geddaparay . Jemper . | Do. . | ,, |
| 62 | Drilling machine. | A machine to work and give force to drills. Machines are made to work by hand, and others by compressed air or by steam. | Yenthrum . Jumper machine | Do. | ,, |
| 63 | Dangerous place. | A place that is for the time being dangerous from any cause. | Appaya veddum, Apayamyedam, Abayamana yeddum. | Do. | ,, |
| 64 | Drum for engine, crab, etc. | The part of an engine or other machine round which a rope or chain is wound and unwound. | Drum, Kyroo Chuckrum. | Do. | ,, |
| 65 | Dressing . | The cutting, squaring up, or finishing of the sides of roads or shafts. | ..... | ... | |
| 66 | Donkey engine | A small pumping engine for feeding steam boilers, etc. | Thanny Eyukum Chinna Thanny Engine. Thunny Yenthrum. | Do. | ,, |
| 67 | Dumb drift . | A short tunnel or passage connecting the main return airway of a mine with the upcast shaft in such a way as to avoid the return air passing through or over the ventilating furnace fire. | ..... | ... | |
| 68 | End . . | The furthest end of a driving . | Soorungam Kuddchee. | Do. . | ,, |
| 69 | Employés:— | ..... | Valakarum, Yutheyogam, Yoothiyogasthen, Valaykar. | Do. . | ,, |
| | (*a*) Man . | ..... | Mannoothan, Manishiam, Manithen, Manither. | Do. | ,, |
| | (*b*) Woman . | ..... | Sthreegal, Pengall, Stree, Ponbala, Pendoogel. | Do. . | ,, |
| | (*c*) Boy . | ..... | Pasangal, Pyan . | Do. . | ,, |
| | (*d*) Girl . | ..... | Chinna Pengal, Pen, Pengal, Pennoo. | Do. . | ,, |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 70 | Engine . | ..... | Engine. Yenthrum. | | |
| 71 | Face . . | The extreme end of a tunnel or mining excavation, but usually denotes the miner's place of work for breaking down rock or coal. | Surungam Mothal. | Tamil . | Kolar Gold Field, Mysore State. |
| 72 | Fault . . | A disturbance, throw, or dislocation in strata; also called a "Throw." | ... | ... | |
| 73 | Feeder . | A small vein running into a main lode. | Kodee Sarah . | Do. | ,, |
| 74 | Fissure | A crack or rent in the rock . . | ... | ... | ,, |
| 75 | Footway . | A shaft or part of a shaft fitted with ladders and stages, and used only for the descending and ascending of miners and other persons, but not for drawing material. | Kaluvayee, Yaneevyee, Kalvalee, Yaneevully. | Tamil . | ,, |
| 76 | Frame . | A dunze or setting of timbers. A frame for a shaft consists of a set of four strong shaped and fitted timbers used to support the shaft sides; their shape and size when fitted is the same as that of the shaft. | ... | ... | |
| 77 | Footage . | This is a term used in setting out, measuring, and paying for work done. It refers to the English foot. | ... | ... | |
| 78 | Fan drift . | An enclosed passage leading from the top, or near the top, of an upcast shaft to the ventilating fan, and along which the whole of the return air passes to the fan. | ... | ... | |
| 79 | Fire-board . | A danger board or warning board to serve as a caution and warning of danger with a view to prevent persons going into danger. It is the name given to the board more especially used where firedamp is the danger. | ... | ... | |
| 80 | Firedamp . | The explosive gas of coal mines—$CH_4$. It is chemically known as methane, methyl hydride, and marsh gas; it is also called Protocarburetted Hydrogen gas, and Light carburetted Hydrogen gas. | ... | ... | |
| 81 | Gad . | This is a steel wedge used for driving into material by means of a hammer or sledge for the purpose of breaking or loosening the material. Also called wedge, moyle, and mule. | Yeggooharpoo . Yagoomulla . | Tamil . | ,, |
| 82 | Gangue . | Is non-metallic rock in a lode, or the material with which the metallic portions are mixed. | ... | ... | |
| 83 | Gunpowder . | Blasting powder. That used at Indian mines consists of nitre, sulphur, and charcoal in various proportions. | Vuddee Marunthoo. Toobaccee Murinthoo. Toopaki Marunthoo. | Tamil . | ,, |
| 84 | Gunnies . | A name given to abandoned levels or workings. | Palayaganee; Pullayagunny, Kallee gunny. | Do. . | ,, |
| | | | Pathagany . | Telugu . | ,, |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 85 | Gob . . | The same meaning as "goaf," or "goave." It is the waste or finished parts of mine workings; also the stones, dirt, rubbish, and stone built walls and packs, and everything left behind, in the worked-out parts of a mine. To gob is to stow or pack with stones or rubbish. | ... | ... | |
| 86 | Hanging wall | The upper wall of a lode . . | Neeloovie . Malpakka Chavaroo . | Tamil . | Kolar Gold Field, Mysore State. |
| 87 | Horse . . | A term applied to masses of country rock found in a lode and dividing the lode for some distance. | ... | ... | |
| 88 | Hard, solid | ..... | Cutinaman . Balavoo or Ghetty, Oorthi Rumbogetty, Gatti. | Do. . | ,, |
| 89 | Halvans or Helvans. | Refuse heaps of mines which still contain a small portion of ore; also applied to the residue of the dressing processes. | ... | ... | |
| 90 | Hammer . | Mallet used in striking the borer or jumper. | Samati . Chamati, Shumtee. | Tamil . | ,, |
| 91 | Hammer, maul, or mall. | A large hammer for beating the borer. Other forms are—sledges for breaking rock and driving the gad; lath sledge used for driving the laths, etc., when timbering; spalling hammer for breaking or cobbing the ore into small sizes. | Samati . Parea samati . Peria chamati . | Do. . | ,, |
| 92 | A small hammer. | ..... | Suti . Sinna samati, Soothi, Kyechuthee. | Do. . | ,, |
| 93 | Hanger-on . | The man who loads the cage, skip, or bucket down the shaft, and gives the signal to hoist. | ... | ... | |
| 94 | Inset . . | The entrance from a shaft to the mine workings where the cages, etc., are loaded, whether at the bottom or only part way down the shaft. | ... | ... | |
| 95 | Joints . . | Natural divisions of strata . . | ... | ... | |
| 96 | Jig . . | A self-acting incline where the loaded wagons going down pull up an equal number of empty wagons by means of a rope and pulley. Also a machine for separating ores or minerals from worthless rock by means of their difference in specific gravity. This is also called a "jigger" or washer. | | | |
| 97 | Kibbal or kibble, bowk. | A bucket or small barrel used to draw materials out of a mine; also sometimes applied to the skip. The kibble proper is most often made of boiler plating riveted together. A small size for use in a winze is known as a "winze kibble;" a larger size is called a "whim kibble." | ... | ... | ,, |
| | | | Mannu Thotty Thooty, Kyethotty. | Tamil . | ,, |
| | | | Buckini . | Telugu . | ,, |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 98 | Loam | A mixture of fine sand and clay | Ponnoo Calloo<br>Calippoo Manoo<br>Bunka Munnoo<br>Kullapoodum Munnoo | Tamil<br>Tamil<br>Telugu<br>Tamil | Kolar Gold Field, Mysore State. |
| 99 | Lode, Vein, or Reef. | A fissure, or rent, or chasm filled with ore bearing matter, and contained between two walls named the hanging wall and the foot wall. The mass of rock on both sides of the lode is called the "country", or "country rock." | ... | ... | " |
| 100 | Lighting a shot. | The process of bringing about an explosion. | Vadee Vuthee<br>Vadie Kolathoo<br>Vudnee Vye | Tamil | " |
| 101 | Labourer | ..... | KustumEdulkun<br>Cooley Valie<br>Alloocan | Do. | " |
| 102 | Ladder | ..... | Yany, Yanee, Yainee.<br>Keelayera-karathu. | Do. | " |
| 103 | To Lower | ..... | Hurreah<br>Yarakoo<br>Veelay yerracoo<br>Ariya | Do.<br>Laskar Hindustani. | " |
| 104 | Lid or cap | A piece of timber put on a prop or at the end of a sprag or stretcher. | Moody | Tamil | " |
| 105 | Landing | The top or bottom of a shaft, slope, jig, or engine plane, or other place of loading. Also a level stage for loading or unloading coals upon. | ... | ... | |
| 106 | Mate | A partner at work | Bagasthan<br>Kotallee<br>Sinagithen, Pungali.<br>Pungookoran | Do. | " |
| 107 | Mine | ..... | Gunee, Gynny | | |
| 108 | Mine shaft | ..... | Gunny Nillavay<br>Company Gunee<br>Gunee | Do. | " |
| 109 | Maistri | ..... | Maistree<br>Mothally | Do. | " |
| 110 | Man-way | A small passage used as a travelling way for the miners, and also often used as an air-way, or chute, or both. | | | |
| 111 | Mercury | Quicksilver | Patharasam<br>Russum, Rojum | Do. | " |
| 112 | Main roads | The principal underground passages of a mine. | ... | ... | |
| 113 | Noger or Auger. | A drill commonly used as a jumper. Other forms and names are borers, striking borers, drills, and bits. | Eyuuku, Kumbee.<br>Yeggoo<br>Guddaparay | Do. | " |
| 114 | Ore | The substance specially containing the metal. | Poon Kulloo<br>Ooloogum<br>Kalloo<br>Ponnoo Kulloo | Do. | " |

*Glossary of Mining terms and corresponding Indian terms*—continued

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 115 | Plot or Plat . | A place prepared to receive ore . | Kulloo Munoo . Sarkumyidum . | Tamil . | Kolar Gold Field, Mysore State. |
| 116 | Pyrites . . | Native mineral composed of sulphides, arsenides, or both. | Aram . . Kakapornoo . Thikul . . | Do. . | ,, |
| 117 | Pryan . . | Cornish for clay . . . . | Thina Kooly . Thinum . . | Do. . | ,, |
| 118 | Puppy . | An underground tier or set of pumps. | ... | ... | ,, |
| 119 | Place of work | ..... | Valasayumyedam, Valasayadum, Valaycheyirviym Yedum. | Tamil . | ,, |
| 120 | Pit bottom or top. | ..... | Adeekoyee, Nodaya (bottom sump) Gunny Malay . | Do. . | ,, |
| 121 | Hand Pump . | A pump to be worked by hand . | Kayee . Kyee Pump . | Do. . | ,, |
| 122 | Prop . . | A nearly vertical supporting timber. | Woothamana Kuttay. | Do. . | |
| 123 | Pit-head wheel | The wheel or pulley on the headgear or other similar construction. | Sallamthu male Chakaram . | Do. . | ,, |
| 124 | Points on tramways. | ..... | Points . . Konagal Pintoo . | English . Tamil . | ,, ,, |
| 125 | Plank . . | A thin flat timber . . . | Marapalavay . Palagay, Palaga, Pulligay. | Do. . | ,, |
| 126 | Pitman . | The person appointed to keep the pumps and shaft in order. | Sumpugalay . Parkam Maistry Pumpookaren Pump Karun. | Do. . | ,, |
| 127 | Poppet head . | The head gear at the top of a shaft, or pit-head frame. | Sump Gunee Marum. Popade Marum | Do. . | ,, |
| 128 | Pick . . | A pointed tool for loosening earth and rock. Other names are pikes, hacks, slitters, and mandrils. | Sikasoo Pikasoo Pikaxe . . Pikas . . | Do. . | ,, |
| 129 | Pack, or packwall. | A rough wall or pillar built and made up of stones and rubbish to support the roof, or to stow away waste material. | ... | ... | |
| 130 | Pot hole . | A circular and cone shaped hole in the roof of a mine, and the stone that fills the hole. They are a great source of danger. | ... | ... | |
| 131 | To Raise . | ..... | Malay Yarathoo Abbase (Laskar Hindustani). | Do. . | ,, |
| 132 | Reef . . | The outcrop of strata, or a quartz bed or vein, or of a lode generally. | Samoocalloo . Sova Chavay . Poornoo Kulloo | Do. . | ,, |
| 133 | Rib . . | A line of ore in a vein . . | ... | ... | |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 134 | Rise . . | A place of work going from the level upwards. | Mattathel irunthoo. Malukoo Yarum Malyatham . | Tamil . | Kolar Gold Field, Mysore State. |
| 135 | Roof . . | The hanging wall or top side of a lode or bed. | Kappoo Nodaya Male Kappoo Sarie Yoodia Malbagum. | Do. . | ,, |
| 136 | Roof of a level | ..... | Male Mattam . Mal Mattam | Do. . | ,, |
| 137 | Roof examiner. | ..... | Kooray Sarvayidu | Do. . | ,, |
| 138 | Road, General term. | ..... | Manushittan, Koora Sothikaraven Thikaraven. Theruvu, Vyee, Valee. | Do. . | ,, |
| 139 | Raise a little, preparatory to raising. | ..... | Konjum, Edu . Konjum Malyado. Kongum thooku Abase Koonjum | Do. . | ,, |
| 140 | Rope, Steel . | ..... | Eyuku Kavuru Yekkoo Kyroo Yoggoo Kowroo Yeggoo Kyroo. | Tamil . Telugu. | ,, ,, |
| 141 | Rope, Hemp . | ..... | Mota Kavuroo Janapoora Kyroo Janapum Kyroo Janapoo Kyroo. | Tamil . | ,, |
| 142 | Rails for tramways. | ..... | Vandicu Sodum Vandikumbee . Sodum Kumbee | Do. . | ,, |
| 143 | Rapper . | An iron lever with a hammer head attached to one end and arranged to signal by striking a metal plate when the signalling wire, to which it is attached, is pulled. | ... | ... | |
| 144 | Refuge hole or manhole | A place formed in the side of an underground haulage plane in which persons can take refuge when wagons are passing. | ... | ... | |
| 145 | Regulator . | A construction made in an airway to increase or decrease the size of the airway at that point so as to regulate the supply of ventilating air to a district or districts of the mine. | ... | ... | |
| 146 | Return air . | The air which has passed through the workings of a mine and is returning towards the up-cast shaft or the surface. | ... | ... | |
| 147 | Scal or Scale . | The falling in flakes or scales of the walls of a lode after mineral has been taken out; and the same from the roof of a coal mine. | ... | ... | |
| 148 | Shaft . . | A vertical or inclined excavation for hauling along, for persons travelling along, etc. | Gunnee . . | Tamil . | ,, |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No. of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 149 | Sink, Sump, or winze at the bottom of a shaft. | ..... | Sallam, Chinki . | Tamil . | Kolar Gold Field, Mysore State. |
| 150 | Stamp, or stamps. | The rising and falling weight used for crushing ore, or the machinery used for that purpose. | Sonnuidicum Ovaloo, Olakay Olaka. | Do. . | ,, |
| 151 | Stempel . | A wooden stage on which to work above a lode. | ... | ... | |
| 152 | Stuff . . | The ore associated with the gangue of a lode. | Mannoo . Munnoo . | Tamil . | ,, |
| 153 | Skip . . | This is a rectangular or long iron or steel box fitted with wheels. It is wedge shaped at the end that is the bottom when in use, and that end is fitted with a lifting door and catch. It has a swinging bow at the top end where it is attached to the hauling rope. It is used for hauling material up and down the shafts of metallic mines. | ... | ... | |
| 154 | Skip road . | This is the part of the shaft prepared with rails, slides, guides, etc., for the skip, and is almost for the sole use of the skip. | ... | ... | ,, |
| 155 | Stulls . . | Timbers on which rubbish is left, and fixed for the purpose of supporting the country rock as well as loose rubbish. | ... | ... | |
| 156 | Signals, general term. | ..... | Adiyalam, Syegay | Tamil . | ,, |
| 157 | To Signal . | ..... | Adeyalam Saya Syegay Say . | Do. . | ,, |
| 158 | Shot hole . | The hole prepared to receive a blasting charge. | Chutta Koolie . | Do. . | ,, |
| 159 | Steam . . | ..... | Avy, Avee, Havey, Steam. | Do. . | ,, |
| 160 | Side of road . | ..... | Vayee, Sakum Valee Pakum . | Do. . | ,, |
| 161 | Smoke . . | ..... | Sogay Poogay . | Telugu . | ,, |
| 162 | Scraper . . | An instrument made of iron, brass, or copper for cleaning out shot holes. | Irumboo slak Salack, Kumbee Shillack Thoody Kumbee | Tamil . | ,, |
| 163 | Stretcher . | A timber fixed across a road or other space to support the sides. | Puka Muttoo . Thulam . Takerathu . Thakoo . | Do. . | ,, |
| 164 | Side of a shaft or gallery. | ..... | Gunee, Nodaya Pakum. Gunny Pakum . | Do. . | ,, |
| 165 | Sprag . . | A short wooden prop set in a slanting position to keep up the coal while it is undermined. Also a hard piece of wood to put in a wagon wheel to scotch it. | ... | ... | |
| 166 | Scaffold . | ..... | Sarum . Sarungam . | Tamil . | ,, |
| 167 | Sollar . . | A small platform at the foot of a ladder in a shaft. | Yence Nodaya, Mattam. Yanee Keel, Neekum Palaga. | Do. . | ,, |

*Glossary of Mining terms and corresponding Indian terms*—continued.

| No of Terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 168 | Stopes, overhand. | ..... | Stopes Yatham<br>Paranie Yatham<br>Theellay Soorungam. | Tamil . | Kolar Gold Field, Mysore State. |
| 169 | Stopes, underhand. | ..... | Stopes Kela,<br>Paranie<br>Yerakum, Keela<br>Soorungam | Do. . | ,, |
| 170 | Spade . . | ..... | Koree . . | Do. . | ,, |
| 171 | Sett or set of timber. | This is the same as frame . . | Guneekee .<br>Kuttera .<br>Maram . . | Do. . | ,, |
| 172 | Shift or core . | The periodical spaces of time during which miners remain underground at work. | Moray . .<br>Koottum . | Do. . | ,, |
| 173 | Swab stick . | A rod of wood with the fibres of one end beaten loose and used instead of a scraper for cleaning out the mud or sludge from a wet borehole. | ... | ... | |
| 174 | Split . . | 1. A division or splitting of the air current in the mine.<br>2. To divide the ventilating current.<br>3. To divide a pillar of coal by driving a passage through it. | ... | ... | |
| 175 | Staple . . | A pit or shaft that is wholly inside the mine, it is synonymous with "winze" of metal mines. | ... | ... | ,, |
| 176 | Stopping . | An air-tight wall across any passage in a mine, and built of bricks or stone and mortar clay or mud, or rough dry stone and dirt, or made of boards or cloth. | ... | ... | |
| 177 | Sump . . | An excavation at the bottom of a mine shaft, most often an extension of the shaft, and used to hold the accumulating drainage water from the mine and from which the water is pumped to the surface. | ... | ... | |
| 178 | Tackle or Windlass. | This is the Jack roll or simplest form of winding arrangement used at the top of shallow shafts. It is essentially a round wood roll fitted to turn in simple supports and with a handle at each end. | | ... | |
| 179 | Tamping or Stemming . | Material used as wadding to fasten the blasting charge in the shot hole; also the act of doing this. | Burthee . . | Tamil . | ,, |
| 180 | Tamping rod or stemmer. | The rod used for tamping or stemming a blasting charge. It is made of iron, iron tipped with brass, copper, phosphor bronze, etc., the whole of it of brass, or other alloy; or of wood. It is also called a tamping bar. | Puli Sakarum . | Do. . | ,, |
| 181 | Toothed wheel | ..... | Pulloo chukerum | Do. . | ,, |
| 182 | Timbermen . | The men whose duty it is to fix the timbers to secure the mine. | Maramcattam, Manushian.<br>Murum Kattoo giraven.<br>Murrum Allokar | Do. . | ,, |

*Glossary of Mining terms and corresponding Indian terms*—concluded.

| No. of terms. | English Names. | English Meanings. | Corresponding terms used at Indian Mines. | Language of terms. | Where used. |
|---|---|---|---|---|---|
| 183 | Trip . . | A journey of wagons, or of a cage or the skip. | Thiruparathu Vandi Varoovathoo Povathoo . | Tamil . | Kolar Gold Field, Mysore State. |
| 184 | Tally . . | A mark or number placed or attached by a miner to each wagon of coal that he sends out of the mine. They are often numbered iron or tin tickets, but many other and crude forms are in use. They give the number of wagons of coal that each miner sends out in the shift of work. | ... | ... | |
| 185 | Valve (in pump bucket) . | ..... | Cathoo Thirvapparathoo. Kathoo tirpoom Thotti. | Do. . | ,, |
| 186 | Valve (to engines.) | ..... | Engine Nodaya, Engine Avymahay. | Do. | ,, |
| 187 | Vughs . . | These are joints or cracks, or open parts in the rock. They are also sometimes called "breast-heads." They are of importance and to be kept from when drilling for blasting. | ... | ... | |
| 188 | Walls . . | The general term for the boundaries of a lode; the upper one being the "hanging wall," the lower the "foot wall". | Savarungal . Suvaroogal . | Tamil . | ,, |
| 189 | Water barrel . | A barrel for winding water out of a mine. | Thanni Pepa Thanee peepah. | Do. . | ,, |
| 190 | Whim . . | A horizontal drum with vertical axis, with a rope attached and worked by a horse for winding purposes from shallow depths, called also "Horse whim." | Vattama poguratoo. | Do. . | ,, |
| 191 | Whip and Derry. | The shaft top arrangement by which the rope attached to the bucket passes over a pulley supported by a frame, and the other end of the rope is attached to a horse that walks straight forward when raising the bucket. Other names for this are Derrick, and Whipsey Derry. | ... | ... | |
| 192 | Winds or Winze. | A small shaft sunk from one level to another underground. It is called a staple at coal mines. | Malevattam . Keelvattam . Chinna Neeloova | Tamil . Telugu . | ,, ,, ,, |
| 193 | Working barrel of a pump. | The part in which the clack valve or bucket works. | Vallay Sayapatta Pepa . Vala Sayoom peepa. | Tamil . | ,, |
| 194 | Wooden wedge | A general term for any wedge made of wood. | Mara Appungal Marthoo Moolay Apoo Katta . | Do. . | ,, |
| 195 | Water . . | ..... | Thanny . Thanee . | Do. . | ,, |

When sending me a part of the glossary, Mr. P. B. Smith of the Tank mine, Kolar, made the following observations:—

"Although many native names have been given, it must not be understood that they are in general use by the miners. For the ordinary words given equivalents may be found in any language. For the technical terms there are no equivalents, and the natives have consequently adopted them as they stand. Many of the terms in the glossary not only have no equivalents, but no meaning of their own to the native mind. For instance, I have never yet met a native who could define a "cross-course," "dyke," or "fault," or who could recognise one of these if he saw it. I have only put down words in actual use in the mine. They were given me by an underground contractor, who is a Tamil from Vellore, and who has been actually mining for five years."

The following particulars were received late and after the proofs for the Report had been corrected.

It was not thought to be necessary to include Form 24 for the Mysore mines.

## Form No. 23.

*Number of mines at work, average number of persons employed, and weight of saleable minerals wrought during the year 1894.*

| 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NUMBER OF PERSONS EMPLOYED AT EACH KIND OF MINE. | | | | | | | |
| | | | | | BELOW GROUND. | | | ABOVE GROUND. | | | | |
| Situation of mines—State, Province, Division, or District. | Names or descriptions of minerals wrought. | Number of mines at which each mineral was being worked during December. | State or condition of the minerals as named or described, whether dressed or undressed, etc. | Weight wrought of minerals as named or described. | Males. | Females. | Total below ground. | Males. | Females. | Total above ground. | Total below and above ground. | REMARKS. |
| Manbhum District. Chota Nagpur Division. Lower Province. | Coal | 29 | Dressed | 723,710 tons. | 86,403 | 38,713 | 125,116 | 280,790 | 184,238 | 465,028 | 590,144 | These are the numbers for the whole year. |
| | Coal | 7 | Undressed | 500 tons. | 389 | 49 | 438 | 20,506 | 16,339 | 36,845 | 37,283 | |
| | | | | 724,210 tons. | | | | | | | | |
| | Clay | 1 | ..... | ..... | 10 | 6 | 16 | ... | ... | ... | 16 | |
| | Ghooting | 4 | ..... | 1,147 tons. | ... | ... | ... | 12,045 | 7,300 | 19,345 | 19,345 | |
| | | 41 | | | | | | | | | | |

NOTE.—As to the number of persons employed, this Form is only intended to show the average number employed on any one day, or the average daily number of employés.—J. G.

## Form No. 24.

*Record of fatal and other serious accidents.*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date of accident. | Hour of day or night. | Hour of person's shift, or how long been at work. | Name of the mine or Colliery. | Situation of mine. | Description of mine or name of mineral wrought. | Name of the owner or company. | Names and number of persons killed, and whether male or female. | Names and number of persons seriously injured, and whether male or female. | Reputed ages. | Occupations. | Cause of accident, in terms of Form 25, and whether above or below ground. | Remarks on cause, and nature of injury, and cause of death. |
| 2nd March 1894 | Day | 5 | No. 3 quarry, Laikdi. | Laikdi quarry. | Coal | Bengal Coal Company, Ltd. | ... | 1 male, Saboor Kora. | 34 | Coal cutting. | Falls in mine. Fall of roof coal. | Lacerated wound—foot fractured. |
| 7th July 1894 | ,, | 4 | Do. | Do. | Do. | | ... | 1 female, Desooli Malinee. | 45 | Dust Woman. | Miscellaneous below ground. By other causes. | Compound fracture of left arm. |
| 14th Sept. 1894 | ,, | 6 | Do. | Do. | Do. | | ... | 1 male | 28 | Coal cutting. | Falls in mine. Fall of roof stone. | Simple fracture of left upper arm and left foot. |
| 27th Nov. 1894 | ,, | 1 | Do. | Do. | Do. | | 1 male, Sasti Mallu. | ... | 19 | Do. | Falls in mine. Fall of roof stone and coal. | Multiple fracture and laceration and fracture of occipital upper and lower jaws, nasal bone, and lower 4 ribs of each side; displacement of backbone, and rupture of abdominal wall. |

# Form No. 23.

*Number of mines at work, average number of persons employed, and weight of saleable minerals wrought during the year 1894.*

| NAME OF THE COMPANY. | SITUATION OF MINES,—STATE, PROVINCE, DIVISION, OR DISTRICT. | Names or descriptions of minerals wrought. | Number of mines at which each mineral was being worked during December. | State or condition of the minerals as named or described, whether dressed or undressed. | Weight wrought of minerals as named or described. | NUMBER OF PERSONS EMPLOYED AT EACH KIND OF MINE. | | | | | | | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | BELOW GROUND. | | Total below ground. | ABOVE GROUND. | | Total above ground. | Totals below and above ground. | |
| | | | | | | Males. | Females. | | Males. | Females. | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | |
| KOLAR DISTRICT. | | | | | | | | | | | | | |
| 1. The Indian Consolidated Gold Mining Company. | Bowringpet Taluk . | ... | ... | ... | ... | ... | ... | ... | 1 caretaker 2 watchmen. | ... | 3 | 3 | Mining operations suspended for the past year 1894. |
| 2. The Kolar Central Gold Mining Company, Limited. | Ditto . . | ... | ... | ... | ... | ... | ... | ... | 2 watchmen. | ... | 2 | 2 | Ditto ditto. |
| 3. The Coromandel Gold Mining Company, Limited. | Ditto . . | Gold quartz. | 3 | Undressed . | Not recorded . | 160 | ... | 160 | 140 | 20 | 160 | 320 | |
| 4. The Mysore Reefs Gold Mining Company, Limited. | Ditto . . | ... | ... | ... | ... | ... | ... | ... | 3 | ... | 3 | 3 | No work below ground. One engine only at work to keep the water down. |
| 5. The Mysore West, and the 6. Mysore Wynaad Consolidated Gold Mining Company, Limited. | Ditto . . | Auriferous quartz. | 1 | Quartz is hand-picked. | Rough quartz 610 tons. Picked 378 „ Gold 275 oz. | 140 | ... | 140 | 152 | 8 | 160 | 300 | This is the joint account of the two Companies, and it is not possible to divide the information between the two Companies. |
| 7. The Yerrakonda Gold Mining Company, Limited. | Ditto . . | Gold . | 1 | Undressed . | 56 oz. 8 dwt. . | 150 | ... | 150 | 170 | 20 | 190 | 340 | |
| 8. The Balaghat Mysore Gold Mining Company, Limited. | Ditto . . | Do. . | 1 | Quartz dressed and crushed. | Quartz 4,205 tons Gold 5,670 oz. | 841 | ... | 841 | 228 | 10 | 238 | 1,079 | |
| 9. The Mysore Gold Mining Company, Limited. | Ditto . . | Do. . | 3 sections. | Auriferous quartz | 52,249·578 oz. of standard gold. | 1,351 | ... | 1,351 | 1,173 | 126 | 1,299 | 2,650 | |
| 10. The Nundydroog Gold Mining Company, Limited. | Ditto . . | Auriferous quartz. | 2 | Crude . . | 29,750 tons yielding 2,965·7 oz. of gold. | 1,157 | ... | 1,157 | 537 | 84 | 621 | 1,778 | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11. The Nine Reefs Gold Mining Company, Limited. | Ditto . . | Gold . | 1 | Dressed . . | 111 oz. for December last. | 166 | ... | 166 | 110 | 13 | 123 | 289 | |
| 12. The Champion Reef Gold Mining Company, Limited. | Ditto . . | Do. . | 1 | Quartz undressed. | 37,039 tons. | 1,377 | ... | 1,377 | 829 | 140 | 969 | 2,346 | |
| 13. The Oorgaum Gold Mining Company, Limited. | Ditto . . | Do. . | 1 | Auriferous quartz reefs are being worked and the gold extracted at surface. | 65,610·920 oz. of standard gold. | 1,503 | ... | 1,503 | 859 | 140 | 999 | 2,502 | |
| 14. The Gold Field of Mysore Company, Limited. | Ditto . . | Do. . | 1 | Quartz undressed. | ..... | 120 | ... | 120 | 70 | 10 | 80 | 200 | |
| HASSAN DISTRICT. | | | | | | | | | | | | | |
| 1. Haranhalli Gold Mining Company . . | Arsikere Taluk . | Do. . | ... | ... | ..... | ... | ... | ... | ... | ... | ... | ... | Not working. |
| 2. Kempinkote Gold Mining Company . | Chennaroyapatna Taluk. | Do. . | 2 | Undressed . | ..... | 152 | ... | 152 | 222 | 41 | 263 | 415 | |
| TOTAL . | ..... | ... | 17 | ... | ..... . | 7,117 | ... | 7,117 | 4,498 | 692 | 5,110 | 12,227 | |

# Form No. 25.

*A.—Deaths caused by accidents at mines in Mysore.*

NOTE.—Deaths caused by injuries received within 1 year and 1 day from time of accident should be included.

| NAME AND SITUATION OF MINE—STATE, PROVINCE, DIVISION, OR DISTRICT; AND MINERALS WROUGHT THERE. | Year. | FALLS IN MINE. | | | | IN SHAFTS. | | | | | | | | MISCELLANEOUS BELOW GROUND. | | | | | | | | ON SURFACE. | | | | | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Falls of roof, stone, or coal. | Falls of sides. | Falls of coal in working places. | Total falls. | Overwinding. | Ropes and chains breaking. | Whist ascending or descending by machinery. | Falling into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in shafts. | Explosions of fire-damp. | Suffocation by gases. | By explosives. | Irruptions of water, and falling into water. | On inclined and engine planes. | By trams or tubs. | By machinery. | By other causes. | Total { Miscellaneous / Below ground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | Total on surface. | Gross Total. | |
| **GOLD MINES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| KOLAR DISTRICT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. The Indian Consolidated Gold Mining Company (Ld.,) Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Mining operations suspended for the past year 1894. |
| 2. The Kolar Central Gold Mining Company (Ld.,) Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | | Ditto ditto. |
| 3. The Coromandel Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | Ditto ditto. |
| 4. The Mysore Reefs Gold Mining Company, (Ld.,) Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No accidents or deaths, no work being carried on underground. |
| 5. The Mysore West, and<br>6. The Mysore Wynaad Consolidated Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... | ... | ... | 5 | ... | ... | ... | .. | .. | 5 | One accident from blasting gelatine catching a light and suffocating men. The other accident was from coolies drilling in a socket which they are strictly forbidden to do, and are and have been fined for so doing. |
| 7. The Yerrakonda Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8. The Balaghat Mysore Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | 2 | ... | 2 | ... | ... | ... | ... | 3 | ... | 3 | ... | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 | |
| 9. The Mysore Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 | Particulars not furnished. *Vide* Form No. 24 for causes of deaths as given by the Superintendent. |
| 10. The Nundydroog Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | 2 | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | . | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 2 | 2 | 5 | |
| 11. The Nine Reefs Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | . | ... | | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | . | ... | ... | ... | ... | 1 | | |
| 12. The Champion Reef Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | 2 | .. | ... | ... | .. | ... | 2 | | |
| 13. The Oorgaum Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | The Superintendent states that no record has been kept. | |
| 14. The Gold Fields of Mysore, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | | |
| HASSAN DISTRICT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Mysore Harnahalli Gold Mining Company, Arsikere Taluk, Hassan District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | |
| 2. The Kempinkote Gold Field (Ld.), Chennaroyapatna Taluk, Hassan District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | .. | ... | 2 | | |
| TOTAL | | ... | 2 | 2 | ... | 4 | ... | ... | ... | ... | 4 | ... | 5 | ... | 9 | ... | 1 | 8 | ... | ... | ... | ... | ... | 9 | ... | ... | ... | 2 | 2 | 30 | | |

NOTE.—This Form is very incomplete owing, apparently, to records of accidents not being previously required or kept.—J. G.

# Form No. 25.

*B.—Number of persons seriously injured by mining accidents.*

| Name and situation of mine,—State, Province, Division or District; and minerals wrought there. | Year. | Falls in mine. | | | | In shafts. | | | | | | | | | Miscellaneous below ground. | | | | | | | | On surface. | | | | Total on surface. | Gross Total. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Falls of roof, stone, or coal. | Falls of sides. | Falls of coal in working places. | Total falls. | Overwinding. | Kopes and chains breaking. | Whilst ascending or descending by machinery. | Falling into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in shafts. | Explosions of fire damp. | Suffocation by gases. | By explosives. | Irruptions of water, and falling into water. | On inclined and engine planes. | By trams or tubs. | By machinery. | By other causes. | Total { Miscellaneous. Belowground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | | | |
| **GOLD MINES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kolar District. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. The Indian Consolidated Gold Mining Company (Ld.), Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Mining operations suspended for the past year 1894. |
| 2. The Kolar Central Gold Mining Company (Ld.), Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | .. | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Ditto. ditto. |
| 3. The Coromandel Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 4. The Mysore Reefs Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | ... | ... | ... | ... | ... | .. | ... | ... | ... | .. | ... | ... | ... | ... | ... | No accidents, no deaths, no work being carried on underground. |
| 5. The Mysore West, and | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. The Mysore Wynaad Consolidated Gold Mining Companies, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | .. | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | No persons seriously injured. |
| 7. The Yerrakonda Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | .. | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | .. | ... | ... | ... | ... | ... | 1 The Superintendent states that during 1894 there was only one serious accident. A fireman got his arm caught in the driving wheel of engine necessitating amputation. |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8. *The Balaghat Mysore Gold Mining* Company, Bowringpet Taluk, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | 2 | 5 | ... | ... | ... | ... | ... | 5 | |
| 9. The Mysore Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 32 | Particulars not furnished. *Vide* Form No. 24 for nature of injury as given by the Superintendent. |
| 10. The Nundydroog Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | .. | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | | ... | ... | ... | ... | .. | ... | ... | ... | ... | 5 | The Superintendent states that causes are unknown. |
| 11. The Nine Reefs Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | .. | .. | .. | . | . | ... | ... | 1 | ... | ... | 1 | ... | ... | 1 | ... | ... | .. | 6 | ... | 7 | ... | ... | ... | ... | ... | 8 | |
| 12. The Champion Reef Gold Mining Company, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | 4 | ... | ... | 4 | ... | ... | ... | ... | .. | ... | | ... | ... | ... | ... | 35 | ... | ... | ... | ... | ... | 35 | ... | ... | ... | ... | ... | 39 | |
| 13. The Oorgaum Gold Mining Company, Ld, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | The Superintendent states that no records have been kept. |
| 14. The Gold Fields of Mysore, Bowringpet Taluk, Kolar District, Mysore Province. | 1894 | ... | ... | ... | .. | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | 1 | 3 | Particulars not furnished. |
| HASSAN DISTRICT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Mysore Harnahalli Gold Mining Company, Arsikere Taluk, Hassan District, Mysore Province. | 1894 | ... | .. | ... | ... | ... | ... | ... | ... | ... | .. | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | .. | .. | ... | ... | ... | ... | ... | |
| 2. The Kempinkote Gold Field Company, Ld., Chennaroyapatna, Hassan District, Mysore Province. | 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | 3 | 1 | ... | ... | ... | 1 | 4 | |
| TOTAL | ... | 4 | ... | ... | 4 | .. | ... | ... | ... | .. | 1 | ... | .. | 1 | ... | ... | 39 | ... | ... | ... | 8 | 3 | 52 | 2 | ... | ... | ... | 2 | 97 | |

# REPORT

OF THE

# INSPECTION OF MINES IN INDIA,

FOR THE

YEAR ENDING THE 31ST DECEMBER

1896.

BY

JAMES GRUNDY, Esq.,

INSPECTOR OF MINES IN INDIA.

CALCUTTA:

OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.

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CALCUTTA:
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# Report of the Inspection of Mines in India for the year ending the 31st December 1896, by James Grundy, Esq., Inspector of Mines in India.

CALCUTTA,

*30th June 1897.*

## PRELIMINARY.

1. I have the honour to submit this Annual Report for the year ending the 31st December 1896, in compliance with the instructions of the 26th December 1893, that I should submit a report in July of each year. The years included by previous Annual Reports have been from the 1st of July to the end of June; in future they will include, or be for, the calendar year.

This is my fourth Annual Report since coming to India to act as the "Inspector of Mines in India," but it is the first since I was *permanently* appointed to the office of "Inspector of Mines in India."

Permanent appointment.

2. I may here briefly mention that when I came to India at the end of the year 1893, to act as the "Inspector of Mines in India," I did so in the hope that I should return to England at the end of three years' service in India; and my formal agreement with the Secretary of State for India in Council, and the arrangements with the English "Home Secretary" and the "Treasury," were such that I might have given up the Indian appointment at such time as to reach England about the 10th of November 1896, to resume my work in England and in Ireland as an Inspector of Mines under the English Home Office. To make this possible the gentleman appointed to act in my stead in the North and East Lancashire and Ireland district, during my absence from England, was made to clearly understand that his appointment was only a temporary one for three years. But I am now glad to be able to place on record, in this report, that the Government of India has very kindly made such arrangements for my benefit that I have been able to resign my appointment in England, on their making my appointment as Inspector of Mines in India a permanent one.

It now remains for me to constantly devote my best energies to the duties of my office.

And I also offer my best services, within the limits of the duties of my office, to all mine owners, officials, and work-persons in whatever capacity they may be employed, or in any way connected with Indian mines. To speak still more plainly, at the risk of being deemed presumptuous, every person connected with mines may hope to find in me a sympathetic receiver of reasonable accounts of their mining troubles and difficulties, complaints, and want of information; and a ready and confidential helper to the full extent that is reasonably possible. More especially will this always be the case when safety to life and limb is in any way involved, and in all such cases I especially ask for early information and particulars; and urge on mining people to communicate with me as soon as possible in all cases where there are difficulties in dealing with and removing dangers. I make bold to say that mine officials may often be helped through difficulties, and safety to life be secured, by thus communicating with me early; for though I claim no superior skill over and above that they may possess, and probably not near so much local or special knowledge of the case, knowledge that is so often the most requisite, yet the old saying that two heads are better than one is often very true indeed in the case of serious mine difficulties, and I

know from many years of very varied experience that the help of another mind is especially beneficial, especially when it brings to bear the most extensive and varied experience of all kinds of mining difficulties and dangers that it is the lot and the privilege of an Inspector of Mines to become acquainted with.

Mining improvements.

3. Indian mining is in many respects far below the standard reached in other countries, and far below what it ought to be in India, and I earnestly ask all mining officials to give what help they can to improve the conditions of Indian mining. Improvement of a solid and lasting nature cannot be attained by the mere asking for, nor by an order of a mine official, nor, as a rule, in a short time; the conditions prevailing in India are such that it requires constant and persevering effort and a strong determination to overcome all difficulties, combined with very great patience, tact, forbearance, and a spirit of learning all that can be learnt by a European of the native character, ways of thought, their actual condition, and their own views and standpoint. Continued but judicious perseverance will overcome most things even in India, and I purpose applying some of this myself in the hope that improvement will surely though perhaps slowly grow, and I trust there will be many striving for the same goal. Amongst the many matters for which improvement and extension is eminently desirable, if not actually necessary, may be mentioned the following, *Technical matters of practical working*, of which very many more might be named, *but are purposely omitted.*

## SUGGESTIONS FOR IMPROVEMENTS.

There is plenty of scope for incessant and persevering work in (1) matters that will tend to lessen the number of mining accidents; (2) improving the health of the work-people by making the conditions under which they work, and their homes, more healthy; (3) the establishment, and successful working of sick and accident funds for the relief of the injured and the needy, amongst the mining people; (4) the relief of pain, care of the injured, and the saving of life by the dissemination of the knowledge and the *practice* of "First aid" principles for the timely relief of the sick and injured in the critical and urgent moments during which a doctor's skill cannot be secured; (5) bringing about a better mutual understanding and good feeling between the employés and all officials, and to which end a better knowledge of the language of the people, their manners, customs, religions, and ways of thought would greatly facilitate; (6) a more intelligent and ready compliance, by the work people, with the orders of all officials placed over them, as well as of the ordinary rules of the mines; (7) increased desire for mining employment on the part of the native inhabitants, a greater interest in their work when employed, more regularity in the hours of work, and a more intelligent and readier adaptation of the best ways and means of doing all their work; and (8) the general improvement of the mining people, all mining work, and the success of all Indian mining enterprises. The above shows that none need be short of interesting and very profitable work, and I again express the hope that with such an abundance of good work awaiting the willing worker the labourers will not be few, and I can bespeak an ample reward for those who value gratitude and success.

Many improvements have been made in some mines since mining inspection began in India at the end of the year 1893. I do *not* claim that the improvements are due to me or my work, but those most closely connected with them are the readiest to state that mining inspection, in a broad sense, has had much to do, either directly or indirectly, with many of the important changes for the better. As the officials of the East Indian Railway collieries are the readiest to adopt any suggestions that appear to contain something of advantage to the collieries, and also to give me any information I may require, I am best able to

give a few particulars of advances that have been made, in the way of improvement, since I first became acquainted with those collieries. But before the time that I inspected those collieries with Dr. Saise, to get a thorough insight of their working, they were a long way ahead of most other Indian collieries in many respects that tended to increase the safety and better working of the collieries, as for instance the hospital, medical, and relief provisions for the sick and injured; the comfort and health of the work, people; and the education of the workmen's children, and the training of the most advanced and intelligent of the workmen's sons as workshop and outdoor mistris in several departments, and in the very important employment as winding kalasis. And it is the continuation and advancement of a few of such advanced improvements as these that the following most especially refer to, with the object of giving those who may be willing to follow in their footsteps an opportunity of becoming acquainted with a few of the things that are not ordinarily practised, and consequently not to be met with in the usual run of Indian mining.

## IMPROVEMENTS AT THE EAST INDIAN RAILWAY COMPANY'S COLLIERIES.

(1) *Increase of the European staff.*—"The proposal for legislation, with a rather bad accident in 1893, have led to an increased European staff. The mines, in 'broken work,' are now inspected every day and each place is seen; and in the 'whole mines' this is done nearly every day. The supervising staff has been doubled, and the output has increased 50 per cent. in the last 3 or 4 years. I find now less difficulty in getting increased staff, if I mention that it is a question of safety."

(2) "One mining student, from the Sibpur Engineering College, has joined the East Indian Railway collieries as an apprentice or pupil, the Government of Bengal paying the pupilage fee to the Superintendent of the Collieries. This pupil is doing very well, and as he starts with a first-rate engineering education he promises to be a success." It may be well to give the following information with reference to the new scheme of granting "Mining Scholarships.

The late Lieutenant-Governor of Bengal was very anxious that this system of giving "Mining Scholarships" should be a complete success, and I have little doubt but that the present Lieutenant-Governor will be glad to see that the scheme is meeting a want in Bengal. Up to the present, the students at the Sibpur Engineering College have not been very anxious to take up this department of work, the reason appearing to be that they failed to get any satisfactory surety that they would be as likely to get good employment after having passed through the complete course as appears to be assured to them, in some way, in the other departments of engineering. The students appear to want a promise being made to them, or to be in some other way well assured that there will be good positions for them after the completion of the full course; and they are the more anxious about this with the course being new so that they have not, to rely on, the experience of other students who have passed the course and experienced the difficulty or otherwise of getting suitable employment. I should myself be glad to see the scheme working quite successfully, and I know of no reason why it should not be successful. And, I may say that I fully believe there is scarcely another department of work in India in which a really good man can so easily get good employment, with a good salary, and with every opportunity of quickly rising to the top of his profession. But it should be clearly noted that I only bespeak these great advantages *to really good men*, and I shall be very sorry if they attract and draw in men of any other kind, as I much fear they may after a little time when the advantages of a mining career become better known.

It has been arranged so that on the result of the University Examination for degrees and licenses, two graduate mining scholarships of ₹50. each, and tenable for two years, will be awarded.

In the Annual Report on the Engineering Department of the Civil Engineering College, Sibpur, for 1895-96, may be found the following statements:.

"*Mining Scholars.*—For the last three years, since it was proposed to establish these scholarships, no students have come forward for this class of training, and there is a reference to this effect in my report of last year. During the year under review, however, one student has volunteered for this work, and is now, after graduating in Engineering, undergoing training in the East Indian Railway Colliery at Giridih. According to the present rules a mining scholar must be a graduate in Engineering of the Calcutta University, and now that a graduate has been induced to go in for this work, it is possible that others may follow in his footsteps, but I fear that many will not be led to take up this line. During the course of the year, however, I have received many applications from outsiders who have heard that mining instruction is to be added to the College curriculum, so that the demand for this class of education has arisen, and in the event of Engineering graduates not coming forward for mining instruction, it appears there are others eager to learn the work. It is with great satisfaction, therefore, that I am able to state that the College laboratory under Government sanction will soon be in a position to undertake the instruction of students in this branch, a very considerable grant having been allotted for the purchase of the necessary apparatus."

(3) "*Medical Staff*—Consists of—

1 Assistant Surgeon.
4 Native Doctors.

The former resides near the hospital which has two men's and one women's ward, and a verandah round three sides for visitors of the patients.

Nurses are not provided. The wife or some member of the patient's family is paid to cook and attend under the directions of the Assistant Surgeon.

The native doctors live each in the centre of a group of villages over which he exercises the powers of inspector of nuisances, health officer and family doctor. He has also to go into the mines when an accident occurs, as no person injured can be removed from the mine except under the orders and directions of a native doctor.

The native doctors drill all sirdars in 'First aid.' It is a condition of employment that sirdars must be acquainted with 'First aid.' 'First aid' boxes are kept at convenient stations on the colliery for use."

(4) *The use of safety lamps.*—"The double bonnetted Marsaut lamp is in use with a lead plug instead of a lock for fastening. There are 200 of such lamps in stock, but only 20 are in use at present. These lamps were specially imported. The lamps bought in India (the Clanny and the Davy) were provided with screw fastening which the natives opened. The Santal miners are the only people who have taken to these lamps. The Hindoo and Mahomedan invent every species of excuse against their use. The real objection is the 'lock' which prevents the abstraction of the oil for home use. The unused oil goes back at the end of the shift, in the lamp to the lamp-trimmer's office.

One explosion occurred before the introduction of the safety lamp. None have occurred since."

(5) Pit ponies are used as follows:—

| | |
|---|---|
| At Kurhurbaree . . . . . | 12 ponies. |
| At Serampore . . . . . | 15 ,, |
| Mares in foal or with young . . . . | 10 ,, |
| Foals . . . . . | 12 ,, |
| Giving a total of . . . . . | 49 ,, |

"The ponies vary in size from 11 hands to 13½ hands. They are chiefly country-bred. An endeavour is being made to improve the breed—to increase the bone and strength by crossing with Burma stock. The foals look very promising so far as our experiments have gone.

The food given to the horses varies. When grain was cheap, it was the only food given, with grass in the wet season and chaff (of rice straw) in the dry season. The high price of grain has led to the use of maize, at times mixed with oats. The cost per maund is at present—

| | ₹ | a. | p. | |
|---|---|---|---|---|
| 1 part, of oats . . . | 5 | 1 | 3 | per maund. |
| 2 parts American maize . | 3 | 5 | 0 | „ (crushed), |

which works out to an average of ₹3-14-5, which is very high. The cost per head in August 1856 was ₹10 for dry food, exclusive of grass. Now it is ₹13.

The ponies come out to the surface on Saturday nights where there are inclines, and remain until the pit re-starts work. Those, where shafts are the only means of egress, remain underground in well ventilated, comfortable stables until a change is deemed necessary.

The syce grooms the horse and is the driver when the animal is at work pulling tubs about.

There is a head horse-keeper at each colliery to look after the syces."

---

Official address.

4. On the 5th of last March, I removed my office from the room in the older Imperial Museum Building to rooms on the ground floor and at the south end of the most recently built red brick edifice running north and south behind the older Museum Building. The proper way to it from Chowringhee Road is by a new entrance and road immediately on the south end of the older Museum Building and the north end of the Government School of Arts; this new road leads directly to my office, which may be entered by a door near the foot of the staircase. It should be well noted that my official address is still No. 27, Chowringhee Road, Calcutta, and communications so addressed will be sent on to me to any part of India where I may happen to be.

Mining Library.

5. I have collected together a good set of mining books, and books of reference more or less related to mining; also English Inspector's and many other mining reports, some of which are very old and very valuable; all these may be consulted in my office almost at any time. I shall be glad to see mining people at my office, and to see them making good use of the many valuable mining books of reference that I have got together. I may also draw attention to the most valuable and extensive library of the Geological Survey of India which is most convenient and handy for visiting from my office; so that no one need now be at a loss for mining literature to consult when they happen to be in Calcutta, and I do not think there is such another good opportunity of the kind in any part of India, and there are not many such opportunities of consulting such an extensive and valuable set of mining books, reports, and journals even in the United Kingdom. I hope to increase and make my set of mining works still more valuable.

Notices and returns.

6. As to returns, reporting and investigation of accidents, and other matters connected with inspection work, I have again to repeat in substance what I said in my last report. The returns come in most irregularly and late, and many are not sent at all; even the reports of accidents are greatly neglected, and this neglect, and the omissions have now attained such proportions that it has been found impossible to formulate reliable statistics, with any degree of completeness, for this report. These remarks apply to output, number of mines at work, number of persons employed, and accidents.

It now appears that there will be no success in this matter of notices and

returns, and the preparation of comparative statistics, until every return is sent to me *direct*, thus enabling me to send reminders, etc.; and, possibly, there will be nothing done satisfactorily until there is compulsion by law. An Indian Mines Act is now wanted, for so long as there is no compulsion the returns are not regularly sent, statistics cannot be formulated, and until we get reliable and full returns, from which accurate statistics can be formulated, the true position of Indian mining as to output, persons employed, accidents, etc., and the relative position with reference to other countries cannot be properly ascertained; and everyone using this my Annual Report should remember that all the lists and figures that depend on the returns are quite incomplete, and only correct so far as I was able to make them so from the incomplete sets of returns received. This neglect to comply with the request of the Government of India to regularly send accurate notices and returns will most assuredly hasten on the time when these requirements will be compulsory by law, and for this the mining officials can only blame themselves.

No one need doubt that the returns are necessary, many reasons for requiring them, and requiring them as correctly compiled as is possible, could be readily given; and the number at present required to be sent in have been cut down to almost the lowest possible limit; so that I hope the returns will all come properly in future, and that the statistics may be quite reliable and available for reference in proper time.

*Statement showing the districts, etc., from which returns have been received for 1896.*

| Division, District, and Sub-division from which received. | Form 26. Names and positions of mines. | Form 23. Output, persons employed, etc. | Form 24. Details of accidents. | Form 25. Accidents classified. |
|---|---|---|---|---|
| Burdwan Division | Received. | ... | ... | ... |
| Burdwan District, Raniganj Sub-division, for Deshurghur mine only. | ... | ... | Received. | ... |
| Chota Nagpur Division | Received. | ... | ... | ... |
| Hazaribagh District, Giridih Sub-division | ... | ... | Received | Received. |
| Manbhum District | ... | Received. | ... | ... |
| Gobindpur Sub-division | ... | Received | Received | Received. |
| Bhagulpur Division | Received. | ... | ... | ... |
| Central Provinces | Received. | ... | ... | ... |
| North-Western Provinces and Oudh | Received. | ... | ... | ... |
| Bulandshahr | ... | Received but blank. | Received but blank. | Received but blank. |
| Punjab | Received. | ... | ... | ... |
| Baluchistan | ... | Received | Received | Received. |
| Bombay Presidency | Received. | ... | ... | ... |
| Hyderabad (Deccan) | ... | Received | Received | Received. |
| Hyderabad Assigned Districts | Received. | ... | ... | ... |
| Madras | Received. | ... | ... | ... |
| Travancore and Cochin | Received. | ... | ... | ... |
| Trincomalli and Nellore | Received. | ... | ... | ... |
| Travancore | ... | Received | Received | Received. |
| Assam | Received | Received | Received | Received. |
| Burma | Received. | ... | ... | ... |

This tabular statement shows that only a few of the most important returns

were received, thus making it impossible to give reliable statistics, or to draw up this report either punctually or with satisfaction.

Form 26 is now practically replaced, as a return, by half-yearly statements of mines started and abandoned during the half-year immediately preceding.

It would not be necessary to send returns of Form 25 if Form 24 was *accurately* and *regularly* sent at the proper times, *i.e.*, as soon as possible after the separate accidents happen.

Form 23, and the notices of accidents on Form 24 are the most important, and nothing should be allowed to interfere with the accurate and punctual sending of this return and notices, but, as shown by the tabular statement, few were received for the year 1896.

7. *Notices of accidents, Form 24.*—The following is a copy of an important circular issued by the Government of India, it being of the very highest importance that all *fatal* accidents, and even the serious non-fatal accidents, should be promptly reported to the Inspector of Mines, and that he should make an effort to promptly inspect the place and investigate all accidents that appear from the accident notice to give promise of good being done thereby, such as when there is something peculiar that is likely to lead to a warning and a lesson being learned; when the accident itself presents a caution which, if properly realized, will do much to prevent further similar accidents. There are many other considerations that make inspection and the investigation of accidents necessary, but the one great aim that should be the guiding principle is the prevention of accidents.

Circular No. $\frac{3}{7-2}$.

FROM

F. G. SLY, ESQ., C.S.,

*Under-Secretary to the Government of India,*

To

Dept. of Rev. and Agri.
*Geology & Minerals.*

*Calcutta, the 24th February 1897.*

SIR,

A permanent Inspector of Mines having been appointed for India, it is important that, for the proper performance of his duties, he should receive early information of all fatal accidents which occur in mines. Provision has been made in the draft Mining Act and General Rules for the reporting of all serious accidents, but at present there is no legal liability upon mine-owners and managers to report them. The Government of India believe, however, that mine-owners and managers will willingly assist Government by giving prompt notice of fatal accidents, so that the cause of the accident may immediately be investigated and suggestions made, if possible, for the prevention of similar occurrences in future. I am therefore directed to request that, with the permission of
mine-owners and managers may be requested to send to the official address of the Inspector of Mines, Calcutta, a notice of every accident which occasions loss of life, within twenty-four hours of its occurrence, in the form appended to this circular.

It will of course be impossible for the Inspector to visit every mine on the occurrence of a fatal accident, but he will use his discretion to make visits where this can be conveniently done and where an enquiry seems likely to be useful.

I have the honour to be,

SIR,

Your most obedient Servant,

F. G. SLY,

*Under-Secretary to the Government of India.*

*Form of notice of Accidents.*

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Date of accident. | Hour of day or night. | Name of the mine. | Situation of mine. | Description of mine or name of mineral wrought. | Name of the owner or company. | Names and number of the persons killed, and whether male or female. | Reputed ages. | Occupations. | Cause of accident according to terms detailed on the reverse and whether above or below ground. | Remarks on cause of death. |
| | | | | | | | | | | |

*The following are the terms to be used in column 10 :—*

1. *Falls in mine—*
   Fall of roof, stone, or coal.
2. *Falls in mine—*
   Fall of sides.
3. *Falls in mine—*
   Fall of coal in working places.
4. *In shaft—*
   Overwinding.
5. *In shaft—*
   Ropes and chains breaking.
6. *In shaft—*
   Whilst ascending or descending by machinery.
7. *In shaft—*
   Falling into shaft from the surface.
8. *In shaft—*
   Falling from a part of the way down.
9. *In shaft—*
   Things falling from surface.
10. *In shaft—*
    Things falling from a part of the way down.
11. *In shaft—*
    Miscellaneous.
12. *Miscellaneous below ground—*
    Explosion of fire-damp.
13. *Miscellaneous below ground—*
    Suffocation by gases.
14. *Miscellaneous below ground—*
    By explosives.
15. *Miscellaneous below ground—*
    Irruptions of water and falling into water.
16. *Miscellaneous below ground—*
    On inclined and engine planes.
17. *Miscellaneous below ground—*
    By trams or tubs.
18. *Miscellaneous below ground—*
    By machinery.
19. *Miscellaneous below ground—*
    By other causes.
20. *On surface—*
    By machinery.
21. *On surface—*
    Boilers or steam-pipes bursting.
22. *On surface—*
    On railways or tramways belonging to mine.
23. *On surface—*
    Miscellaneous.

The notices of accidents, in compliance with this Government Circular, were apparently well sent for a short time, but they soon appeared to fall off. The notices of fatal accidents began to reach me in April of this year, but after about three month's time they almost ceased to come in. During the time that I was properly receiving the notices of accidents I inspected the places of accident and investigated at Giridih, Barakar, Sitarampore, Assansol, Kalipahari, and at mica mines in the neighbourhood of Koderma, Hazaribagh District; and I have no hesitation in saying that several of the accidents that I investigated should not have happened because they could have, and probably would have, been avoided if the ordinary and clearly necessary precautions had been taken. The accidents I investigated afforded ample proof that lives were being lost that might be saved, and that the reporting of accidents by the mine officials is one of the most necessary requirements in Indian mining; and I am confident that I cannot be employed on any work more important, more urgent, or more likely to safeguard the lives of workmen than the investigation of accidents. But to make this most necessary and important work to be effective the mine-owners and officials should be compelled by law to promptly send me the notices, and I should be invested with such legal powers as would enable me to insist on reasonably necessary improvements, for the prevention of accidents, being duly carried out. It may, perhaps, be thought by some that this is scarcely necessary, but in this connection, and as showing the necessity of powers for enforcing attention to what is required for the prevention of accidents, I may briefly mention two cases in point. The first was at a native mine at Kalipahari, near Assansol; a small girl had lost her life in a way that any of the many girls, women, and men employed at the same place and in the same way might lose theirs. The native manager appeared to see quite readily, when pointed out to him, how the accident might have been avoided and further similar accidents prevented, and he at once promised effusively to make the necessary improvement to prevent any further accident, and to let me know that he had done it; but he has not carried out his promise.

The other was a case where two lives were lost, in two accidents, and quite a number of other persons most narrowly escaped with their lives. The circumstances were such that a similar accident might happen any day, large numbers of the work-people were daily running great risk to their lives. I wrote a letter to the superintendent of the company, which is one of the largest coal mining companies in India, in which I pointed out the dangers and their causes, and said I should "be very glad to know what he may have to say in the matter in the hope that he may see his way to put things right". *No reply to this communication has been received.*

This is quite different to the treatment that I receive and the spirit displayed at the East Indian Railway Company's collieries at Giridih, where the officials are always ready to listen to and act on any advice that appears to be beneficial; and I believe there is very ample proof that the colliery has gained by it.

The following particulars of a fatal and another accident, and extract from a letter I sent to the owners, will illustrate how workmen bring about accidents and their own death, how mine officials may sometimes prevent accidents by thoughtful and prompt action, the way the officials ought to act with that end in view, and the great and thoughtful care required from the officials to safeguard the workmen's lives even from the results of their own carelessness. The first was a case where a miner went to work in the evening, when he had been at work in his own working-place but a very short time he left it and went to see another place that was idle and only a short distance away. In this latter working place, which the deceased had nothing whatever to do with, the day miner had left an overhanging lump of roof coal against a fault slip that was very dangerous. When the mine official inspected n the afternoon he

properly fenced off the place to prevent any one going there until it was made-safe. When the deceased went to this dangerous place, and saw that he could get some coal easier there than in his own safe working-place, he got through the prohibiting fence and began to work at the coal when the dangerous overhanging coal fell immediately and killed him. If the official who fenced off the place had pulled down the dangerous coal, which he could have done readily, that man's life would most probably have been saved, although he went to work where he had no business to go. Of course it is well understood that officials cannot remove all dangers as they go round the mine inspecting, but when they can do so in the time available to them it is much the best thing to do, far and away better than fencing off places to warn workmen who are careless and ignorant, and take very little notice of fencing and such similar warnings; and this extra precautionary measure on the part of the officials would probably be the means of saving many lives that are now lost for want of ordinary precautions on the part of the workmen.

Extract from letter.—The investigation, to-day, of the accident "appeared to me to clearly show the following:—

"1. That the place where the deceased met his death was left in a dangerous state by the person last working there owing to his leaving a large piece of overhanging top coal against a fault slip, one or two other sides of the dangerous coal being also without support.

"I think it should be impressed upon all officials as a cardinal rule that no working part of a mine shall be allowed to remain in an unsafe condition, if a moderately reasonable amount of work will make it safe, no matter whether the place is to be fenced off or not.

"2. That although the miners had been at work for about 3¼ hours when the accident happened, that part of the mine had not been visited during that shift by the sirdars, or by any other official, beyond the day sirdar having shown some miners in a neighbouring place where they were to work.

"So long as persons are employed to work alone as coal-cutters who have not sufficient experience of mining to enable them to know when their working place is dangerous, or how to keep themselves safe, it appears to be the duty of mine-owners to provide such a sufficient amount of experienced supervision as will practically secure their safety.

"I am indeed very glad to find that you fully realize this, and that you are making an effort to increase your staff of European Overmen to such an extent as will secure those mines where pillars are being worked out having a European in constant charge. Those parts and 'broken workings' are undoubtedly much more dangerous, and require far and away more supervision and care than the ordinary narrow workings in cutting out a mine."

The other case I wish to refer to was one in which, fortunately the workman was not very badly injured, though he thoughtlessly imperilled his own life and that of a miner near the place. A carpenter mistri named Kungoo Burhi was repairing a "stool" in a miner's working place, and after having taken out a leg from the stool he went up on the top of it to tighten another leg. This overbalanced the stool and it fell on a coal-cutter named Bugloo Miah, slightly hurting his back. The colliery official who sent me these particulars said "a better illustration of the difficulty of keeping natives out of trouble could not be instanced. Bugloo might easily have been killed; he has contusion of the spine. Kungoo escaped practically unhurt." The "stools" referred to are very tall and heavy.

Another accident may be referred to briefly if only to show the effect of Notices and Returns being sent *indirectly* to me instead of directly. Although this accident happened about the middle of September 1896 the first intimation of it that I received was in March 1897, over six months after the occurrence.

It was then reported to me by the Commissioner of Chota-Nagpur as follows:—"In September last, 1896, an accident whereby seven men lost their lives took place in a colliery called Chaitudi in the Gobindpur Sub-Division of this District (Manbhum) belonging to the Katras Jherria Coal Company. It appears that after two days' rain and during a heavy storm at about 9 P. M. on the night of the 15th September a nullah, on the east of the colliery, suddenly rose to an unprecedented height and overflowed not only its own banks but an embankment at the entrance of one of the inclines of the mine. The manager was residing on the other side of the river, and word could not be sent to him as the flood was impassable. Every endeavour was made by the assistant manager, who was on the spot, to prevent the water going down the incline, but to no effect. The result was that seven miners, who had gone down unnoticed to sleep in one of the galleries, were drowned. A careful enquiry was held by the Sub-Divisional Officer, who found that nobody appeared to be in fault. This finding was accepted by my predecessor a few days before he gave over charge to me. The submission of this report has been delayed as the file was overlooked in the file relating to legislation for mines in India. The manager of the colliery has been directed to raise the 'bund' so that no flood can possibly penetrate the pits again."

Reporting to Inspector.

8. There are many serious mine accidents without personal injury that, although no one has been injured, might well, and with great benefit to all concerned, be promptly reported to the Inspector of Mines. This is no mere speculative statement but one based on practical experience, and with a very vivid recollection of human and animal lives being saved, valuable mines safeguarded from destruction, and the owners saved the expenditure and loss of large sums of money, as well as the prevention of the loss of work and wages to workmen. I wish to especially draw the serious attention of mine-owners and officials to this matter just now because there has recently been at least one very serious accident, fortunately without personal injury. It was serious in every sense as affecting the capital, the profits, and the trade of a colliery company. The accident, in the one case, was reported to me but not promptly nor until it was quite too late to do any good. If it is thought by any one to the least extent that I wish for such reports for anything like an inquisitive desire, or to meddle to the least extent with other people's business, then that person makes a great mistake, and it would be no use me wishing for such reports if I was not fully prepared to, at any time and at a moment's notice, give up all thought of my own convenience and even to jeopardize my own safety. If any one does think in that way I hope they will now correct that wrong impression, and try to think more broadly and generously of the work, responsibility, and wishes underlying these expressions. The case of the underground fire at the Damuda Coal Company's Bamondia Mine is a case in point where prompt reporting might have been of great benefit to the owners and to the workmen. Although, so far as I know, no lives were lost, there might have been great loss of life, and I have often thought it was most wonderful that there were no lives lost: the escape of many workmen appeared to be most narrow, and the danger is not yet over if the mine is to be re-opened, for if the very greatest care and precautionary measures be not taken in re-opening the mine there may be very great danger and loss of life. Moreover, I believe that if the earliest indications of the danger had been duly reported, that is, as soon as noxious gas made its appearance in an unusual way, the danger might possibly have been kept at a minimum, and the mine saved from the sad disaster that befell it.

Mine fires, etc.

9. If all the Indian mines, that are, *i.e.*, have coal, more or less on fire were enumerated, as well as those that have been on fire at one time or another, they would make a goodly number in comparison with the total number of mines

being worked, and the total fire-area would be considerable. It appears to be very evident that, as a rule, Indian coal is very liable to fire spontaneously; and when the coal does spontaneously fire in the mine it burns on most persistently. There are at present several cases of mine-fires where the section of the mine pervaded by the fire is regularly well flooded with water every rainy season, yet, soon after the water has subsided, the fire bursts out again as fresh and as vigourously as before, and this goes on year after year; some of this class of mine fires having been burning for a great number of years. It would ordinarily be expected that the flooding of the mine, and the apparent saturation of the strata with water, during one season extending over a few months would be sufficient to extinguish the fire it acted on, but close reasoning may without much difficulty account for this not being so in practice; and, as a rule, the most that can be done in these cases is to make the greatest effort to prevent the fire spreading, to save the remainder of the mine from the effects of the fire, and to reduce the danger attending it as much as is possible. But this stern and persistent fact also points to the necessity of making every suitable precaution for the protection of everything that is, or is likely to be affected by this persistent foe; and one cannot help but think of it in relation to railways and other important property and the mine workings there are already or at all likely to be made under them. The fullest protection to railways where safety to the travelling public is a question of the greatest moment, and to other very valuable surface property, can perhaps be best secured by avoiding any underground work whatever being done under or very near to the line, etc. This restriction would often be extremely inconvenient and costly to carry out, so that the nearest approach to it would be probably adopted in practice, namely, only working out just so much of the mine as would make the necessary roads and passages for haulage and ventilation. It is owing to the important question of allowing, or otherwise, minerals to be worked under important property, and if allowed what restrictions as to depth should be made, having been referred to me for an opinion, etc.; and this question of mine-fires being such an important one in all such considerations, that I have thought it well to draw special attention to it in the hope that mine managers will make the prevention of mine-fires a special object of their concern, for by doing so they will be providing for the safety of themselves and their workmen, and be exercising the best and truest economy by avoiding the unnecessary expenditure of large sums of money.

"Robbing" pillars.

10. The question of miners robbing coal pillars is one that has, apparently, been always looked upon as an important and difficult one in connection with Indian mining. It is also one by which men's lives and the mine itself is often endangered. The thinning of coal pillars, or stealing coal from the corner of forbidden pillars, has caused the loss of many lives; others have escaped with their life but been badly injured, and others have been found committing the offence and been discharged or fined, or, as in a few cases, the man has been brought before the Magistrate and sent to prison. I am of the opinion that in most cases where a workman does such a very bad, dangerous and wilful act as to take down coal from a pillar on which the support of the roof and safety of the mine depends, he should receive the severest punishment when the proof is clear. The miner, for the sake of getting an easy day's work of coal, or to save some of the distance his coal has to be carried, will work off a lump of coal from the corner or side of one of the pillars, especially if it appears to be a little loose and easy to get. This is called "robbing" the pillars.

It is the fact that the outer surfaces of long standing pillars often become formed of somewhat loose and shaky pieces of coal that makes it so dangerous for the miner to go stealing coal from such places; and along with that condi-

tion he works in great haste for fear of being caught. Such places are not provided with timber or other means of making them safe as a proper working place would be; and perhaps no special attention has been paid to the place by the official and his staff, consequently the danger of the place is greatly added to by the conditions under which he works there. But, while attaching great blame on workmen who commit such a dangerous and wilful offence, I am strongly of opinion that the managers and their officials should do all they can to prevent pillar-robbing, and also make such provision that the pillars will, as a rule, be safer than they often are, although this may have the appearance of making it safe to do wrong. The coal pillars might often with great advantage be formed more regular in position and shape, as well as larger in size. If the coal pillars were larger and in more suitable positions for supporting the superincumbent strata, they would do their work of supporting the roof and keeping the mine safe all the better for it, and the pillars themselves would be much less likely to become crushed, and there would be less necessity to fear weakening the pillars too much by having the loose and dangerous pieces of coal worked off when necessary, but under proper conditions and supervision. The system by which miners are paid, that is, the way the miners earn all their wages in India, appears to foster pillar-robbing, and it appears to be not at all improbable that an altered system under which miners earn their wages would put a stop to the commission of this bad offence. A great deal may be done by regular and strict supervision by reliable supervisors, the latter condition not always being easy to fulfil. But if in India the principle of payments was carried out that is so common in England it would probably be more effective in stopping pillar-robbing than anything else; and the alteration would be that instead of paying and making all the wages of the miners depend solely on the amount of coal gotten by them, in other words, if instead of paying the miners so much for each wagon of coal sent out of the mine, *and in no other way*, they were paid partly in the same way as at present and the remainder at so much per foot or yard in length of their working-places driven forward—having a fixed amount or "footage," for a fixed size of gallery or working-place, etc.,—it would, I believe, be very effective in stopping pillar-robbing. Now, under the present system of payments, a miner can only get wages and increase it by sending out a quantity of coal, the more coal he sends out the more wages he gets, and he has no other way of making money; it does not matter to him where his coal comes from, the easier the coal is to get and the shorter the distance it has to be conveyed the better and easier it is for him. With the altered system the place where the coal came from would make a difference in the miner's wages, for the amount he earned would still partly depend on the amount of coal sent out of the mine by him as at present, but it might also as much depend on the extension of his working-place by the coal sent out of it; the effect being that if a miner got a tub-load of coal from the corner of a pillar, robbing, because it was easier to loosen the coal there than in his own and proper working-place, he would, in addition to being liable to be caught as at present, be losing wages in loss of measuring distance, he would, if successful, be paid for the amount of coal but nothing for the distance that that amount of coal would have carried his working place forward.

The relative amounts to be paid to the miners for quantity of coal sent out of the mine and for distance driven might be so arranged as to work well and be very effective in stopping pillar-robbing. The weekly or other periodical measurements would also of themselves have a good effect in the same direction, for the measuring officials would very soon become accustomed to a given quantity of tubs of coal having to come from a given length of driving with given dimensions. At some mines in England, and I believe even in a few

mines in India, the miners both regularly and in special cases are paid by distance only without reference to the quantity of mineral sent out of the mine, much as if the driving was the making of a tunnel in rock. A plan to detect pillar-robbing that has often been tried is that of lime-washing the coal pillars and punishing those miners who send coal out of the mine bearing that distinguishing mark. This method is only to a little extent effective in detecting pillar-robbing and does little to prevent it; still I believe it would be a much more effective method than it is if thoroughly carried out and a watchful eye kept on the coal by responsible persons. No system will work successfully of itself, and so long as lime-washing and the necessary watchfulness that it requires is only half-heartedly carried out, and with the minimum of trouble and expense, so long will it be a failure, the way of everything else that is not properly done.

Whether the system under which miners earn their wages in England has much effect there on this question, or there are other and more effective modifying circumstances, it remains a fact that there is very little pillar-robbing in England even in the mines and parts where it might be most expected to occur, and it is such a bad thing both for the mines and the workmen that it deserves a great effort to stamp it out in India.

Relief of distress.

11. A way of doing good by benefitting mining workmen, while at the same time a binding attachment may be formed, is that most excellent system of "Miners permanent relief societies" or "Associations for dealing with distress caused by mining accidents." It may be taken as a fact beyond dispute that mining work is dangerous work, and there is ample evidence of this statement being as fully applicable to India as to any other country.

There can also be little doubt that the fear of mining dangers is one great reason why many more natives do not flock to the mines for employment where good wages may be earned, and where constant work can be found for very many additional workmen throughout every month of every year. And it may be presumed, with a fair degree of probability, that if there were permanent relief societies attached to the mines to provide for the injured and their families and for the widows and orphans of deceased miners, the great terror of the results of mining accidents, and of mining employment itself would be much lessened. A great deal might be said of the terrors and sufferings caused by accidents, the pain and hunger and anxiety suffered by the injured and their dependents, especially when there is no form of relief from which their necessities can be supplied; and much might also be said of the probable advantages to the mining trade generally that such a general system of permanent relief societies would bring about in the form of better ideas being formed of mining work amongst prospective workmen, and a more permanent and settled condition of the actual miners. This is a matter of such great importance that reference to it, in various forms, will be made from time to time in the hope that mine-owners and managers may realize the advantages to be gained by themselves, and the great benefits to the workmen and their families, and see their way to act vigourously to bring some scheme or schemes for benefit funds to a practical success.

The system of providing relief for the injured and their families, and for the widows and orphans of persons killed at the mines, is being very extensively carried out in England with the very greatest success and benefit to all concerned; and some attempt is also being made to extend the benefits to payments for sickness and natural death, and for old age pensions.

The following figures will give some idea of the vastness of the scale on which this system of membership and benefits is being carried out in England —

## Miners' Permanent Relief Societies, United Kingdom.

*(Report of the Central Association for dealing with distress caused by mining accidents, July 1896.)*

| Name of Society. | Year established. | Number of Members. | Accumulated Funds. | Annual Revenue. | Accidents in 1895. | | Widows on Fund. | Children on Fund. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Fatal. | Non-fatal. | | |
| | | | £ | £ | | | | |
| Northumberland and Durham | 1862 | 121,000 | 215,765 | 107,932 | 168 | 17,450 | 1,104 | 1,215 |
| North Staffordshire | 1869 | 6,001 | 17,204 | 7,111 | 88 | 788 | 96 | 237 |
| Lancashire and Cheshire | 1872 | 54,601 | 122,414 | 66,172 | 100 | 9,270 | 577 | 724 |
| Yorkshire, West Riding | 1877 | 17,164 | 33,526 | 15,269 | 27 | 3,285 | 173 | 235 |
| North Wales | 1878 | 14,076 | 21,579 | 11,443 | 41 | 1,985 | 165 | 232 |
| Midland Counties | 1879 | 6,909 | 5,509 | 4,176 | 7 | 1,349 | 46 | 50 |
| Monmouthshire and South Wales | 1881 | 71,113 | 174,683 | 73,382 | 177 | 14,503 | 843 | 1,440 |
| Midland District | 1883 | 23,186 | 36,287 | 6,364 | 22 | ..... | 100 | 192 |
| (Fatal Accidents only.) | | | | | | | | |
| Yorkshire, Thorncliffe | 1889 | 2,954 | 9,497 | 2,484 | 2 | 378 | 4 | 7 |
| Totals | | 317,004 | 636,464 | 294,333 | 632 | 49,008 | 3,108 | 4,332 |
| | | Members. | Funds. | Revenue. | Deaths. | Injured. | Widows. | Children. |

One of Her Majesty's Inspectors of Mines made the following pertinent remarks in his last annual report with reference to the Relief Societies in his district. I quote them because on the whole they apply generally to all countries and to all districts and mines, and would be endorsed by all who have the good of the people and the coal trade at heart. He said, "If there be anything to alleviate the dreadful calamity which falls upon a woman and her children, due to the sudden loss of their bread-winner, it is the knowledge that by prudent foresight an allowance is secured to them from the funds of a society specially established to provide for such cases. It cannot be said that the workmen's subscription of one penny per week is a hardship, and for this weekly payment, should the subscriber lose his life by accident and leave a widow and children, the widow would receive five shillings per week for life, or until remarriage, and each child two shillings and six pence per week until it is thirteen years of age."

It will, probably, be readily said that such Benefit Societies may do very well for England, but that they would not be at all suitable for India; and it has become quite common to support such remarks by numerous statements that are not always relevant but mostly speculative in their nature. But, fortunately, we have at least one very good "Colliery Benefit Fund" in India, namely, that connected with the East Indian Railway Company's Collieries at Giridih. This "Fund" has withstood the test of time, and, I believe, I am quite right in saying that it possesses the most valuable characteristics of being quite a success that it is liked by the workmen to whom it has proved to be a great boon; the workmen take great interest in it; it is so managed as to avoid imposition; and it is a very good thing for the Collieries and their Owners as well as for the workmen. There is much about this Giridih Fund that might well be copied when establishing other funds, especially as it is a Pioneer Colliery Fund in India, whose rules contain much that time and experience have shown to be best; and enquirers need not hesitate to apply for particulars. The weekly subscription is small, so as to meet the small earnings of the people, "All men pay at the rate of one pice per week to the Fund, and all women and children at the rate of one pice per fortnight or half a pice per week." In addition to these small subscriptions, the Fund is supported by a few other small and irregular sources, for instance, fines are credited to the Fund, as are also lapsed wages, or wages that have been due but not paid for a full year.

The benefits allowed by the Fund to subscribers are:—

For sickness—

| | | ₹ | a. | p. |
|---|---|---|---|---|
| Men | per week | 0 | 12 | 0 |
| Women | „ | 0 | 6 | 0 |
| Children | „ | 0 | 4 | 0 |
| For living births | | 1 | 8 | 0 |

For deaths—

| | | | | |
|---|---|---|---|---|
| Adults | | 4 | 0 | 0 |
| Children not under 3 years old | | 2 | 0 | 0 |

Sick benefits to be paid only for such members of a family as are subscribers; and not to be given for less than 3 days' certified absence, and for these and broken periods over a week the payments shall be—

| | | ₹ | a. | p. |
|---|---|---|---|---|
| Men | per day | 0 | 2 | 0 |
| Women | „ | 0 | 1 | 0 |
| Children | „ | 0 | 0 | 9 |

All benefits to be paid weekly according to the following system.—"A Sub-Committee, to be nominated for each Colliery by the Committee of Management and consisting of one European employé, two contractors and all sirdars, shall prepare weekly a pay-sheet for sick or birth or death payments, and shall submit these pay-sheets, after countersignature by the Colliery Assistant Surgeon, to the Colliery Manager who, after approval, will transmit them to the Treasurer of the Fund for payment." The total transactions of the Benefit Fund from the 1st of May 1892, the date of commencement, to December 1896 are given below.

| | *R* | *a.* | *p.* |
|---|---|---|---|
| Total subscriptions | 22,759 | 13 | 11½ |
| Fines | 2,605 | 4 | 6 |
| Unpaid wages from the year 1889 to 1895 (inclusive) | 6,354 | 5 | 0 |
| Interest realized on balance | 143 | 13 | 3 |
| | 31,863 | 4 | 8½ |
| Payments to sick persons | 13,494 | 2 | 9 |
| „ for deaths | 4,174 | 8 | 0 |
| „ for births | 5,779 | 0 | 0 |
| Balance in hand, 31st December 1896 | 8,435 | 9 | 11½ |
| | 31,863 | 4 | 8½ |

A new branch of the Benefit Fund has been started.—Loans are granted to lease-holders (who are also miners in all cases) on the East Indian Railway estate up to a maximum of R25 per person, at one pice per rupee per month simple interest, to enable borrowers to purchase cattle, seed, and so on. This branch has been well utilized: at the present moment there are over R3,000 out on loan."

It will be seen from the foregoing that this Giridih Miners Benefit Fund has been at work upwards of five years, paid out very large sums as benefits to the needy subscribers, and has still over R8,000 as a balance, from which a novel scheme is being tried of loaning money to miners for the purpose of buying cattle or seed for their land. Truely, "Nothing succeeds like success."

12. *Mine plans.*—The year's work has furnished occasions for seeing some of the very bad results of having incorrect mine plans, such as the workings of a mine being driven through to the dip workings of a neighbouring mine on the rise side of them and letting in the water that the holed dip workings contained. The danger attending such mistakes is very evident, and little need be said of the cost and annoyance involved in dealing with the most unwelcome visitor, the water, and in building dams, etc., to hold and keep the water back in its own side of the workings. So much depends so often on mine plans being correctly made from an accurate survey, and incorrect plans are so liable to lead to very bad consequences both in the loss of life and property, that, in the opinion of many, it should be made penal for a Surveyor to submit an incorrect plan as a true and correct one. The advantages of good and accurate mine plans are not near so much appreciated as they ought to be; and I should indeed be glad to see the Suveyors of the large Indian Mines taking the lead in this direction and striving to make their plans show and be as useful as they ought to be. I do not think there is a single mine plan in India that contains all it ought to show to be as useful as may be rightly and reasonably expected of mine plans. As a suggestion, I will enumerate a few of the details that, wholly or in part, mine plans might often show with great advantage to the Owners and Managers.

Taking the items somewhat at random, the year and even the month when the different parts of the mine were surveyed and plotted, might well be shown; also the magnetic meridian; the direction and rate of dip of the strata in various parts; the scale on which the plan is made, an important item that is not always even indicated; the positions, directions, sizes, etc., of all faults, dykes, bad coal and such like; the correct sizes and shapes of coal pillars, and the galleries should be correctly delineated so as to accurately show the quantity of coal worked out and left standing or unwrought; much might also be done in the way of showing on the plans the amount of coal worked out, and the amount left standing where the seam is thick, and the whole thickness of the coal seam is not worked out at first, as is often the case, some coal being left to form a better roof than the stone immediately above the seam, or a thicker portion of the seam is left at the first working owing to the great thickness of the seam, or coal is left unwrought underfoot for the same reason. These last great additions to the information that could be furnished by mine plans would probably be of such an extensive a nature as to require a separate plan or plans to themselves for the sole purpose of showing the particulars; but the information would be most valuable to the owners and give a means of preventing great loss in the form of wasted and lost coal.

In this connection the quality of the coal might well be indicated even if it was only for the Manager and Owners' private information; this might be given for various parts of the mine where the quality is variable, and for various parts of the seam itself between the roof and the floor where the nature and quality of the coal forming the seam is not uniform. Some of the foregoing would also naturally include the thickness of the seam between the roof and floor, and the varying thicknesses in different parts of the mine. The depths of the vertical shafts, and lengths and inclinations of the drifts or inclines should not be omitted as they often are; and a section of the strata with full details of the nature of that portion of the strata which is adjacent to the coal seam should be regularly and carefully kept convenient for reference. Where the ground is of a disturbed nature, much broken up by faults, much very valuable use might often be made, and money, time, and anxiety saved by having a very accurate and very finely detailed set of sections of the coal seams and adjacent strata. Such detailed sections should be very carefully worded, and should give clear indications, of every variation whatever, of the quality, nature, etc., of the materials forming every part of the seam and its adjacent strata. Finely detailed sections, as here referred to, would be of the greatest help in identifying the strata, and ultimately the seams, when thrown by faults, etc.; and they would be equally useful in correlating the coal seams one with another when they are separated by long distances of unknown ground, as for instance the seams in two or more apparently distinct coal-fields. The magnetic needles of the surveying instruments, upon which the correctness of mine plans so much depends, should have their behaviour regularly watched and tested for every variation. If proper arrangements were made for doing this, a thing that is not at all difficult to do as a rule, then the needle could be readily tested, and it could be done both before and after the instrument was and had been used for important surveys. The principal feature is to select permanent marks in a convenient position, and take the readings when the instrument is carefully sighted at these fixed marks whose direction is unvarying, and if the needle is also unvarying, which can scarcely be expected, the readings should always be the same. It might be of a little advantage if the fixed marks could be chosen exactly in a north and south direction. It should be felt to be of great importance to carefully plot on the plan the exact positions of at least the most permanent and visible of the surface objects, buildings

and other permanent erections, so that the workings may at any time be referred to their proper positions on the surface.

There appears to be much too little thought by Mine Surveyors and Managers of the great errors they may unconsciously make by surveying and trusting too implicitly on surveying instruments that are not regularly tested; and of how much the errors may be increased by using a second or different instrument during one or more surveys. It would be a very great help towards avoiding these errors if means were provided in all the mining districts, as they ought to be, for testing and checking the surveying instruments so that any differences might be allowed for before beginning to plot the survey on the plan. If there should not be convenient and permanent objects for the purpose, it would not be very difficult or expensive to have permanent stones fixed in good and suitable positions on which the north and south line could be very accurately marked or cut in once for always. These "lines of orientation" would provide a ready and permanent means of checking the variations of the magnetic needles where other suitable buildings were not available.

Another useful device that one occasionally meets with is that of dividing up the plan, with fine lines, into squares, each of which have a suitable area as an acre or so many square feet, or perhaps some of the native areas might be used for India. These squares and lines give a ready means of at once judging by sight of the approximate areas or lengths of any part of the plan. If the lines should be objected to as tending to confuse other and more important things, then use might be made of a sheet of tracing or other transparent cloth which has the squares marked on it.

A great deal of the foregoing remarks on mine plans refers almost solely to coal mine plans. It is far and away easier to represent coal mine workings on a plan than is the case for metalliferous mines. For the proper representation of a metalliferous mine, it is necessary to make four drawings: there is (1) the ground plan which should give a general representation of the whole concession, and it should distinctly show the boundary of the property of every land-owner, and all the lodes in the property should be indicated; (2) the working plan giving a general view of the underground workings so as to look as they would be seen from above if the ground was transparent; (3) the longitudinal section, drawn so as to make the workings and mine appear as they would be seen if a section of the ground could be cut away and a side view of the mine so exposed; it should shew correctly all the vertical shafts, the stopes, the dip of the ore-courses, and the surface-line with elevations of the mine buildings; but it gives the levels, diagonal shafts and winzes a false appearance in many respects; (4) the transverse section of great value as it shows the dip of the ore-courses. In the transverse section the view given is as if taken at one end of the workings at right angles to the longitudinal section; this enables the inclination of the shafts and winzes sunk on the lode being shown; and all variations in the dip of the lode may be seen all the way down from the surface to the bottom of the mine, but the levels driven on the lode appear as if they were doorways, while the cross-cuts are correctly shown.

Famine.

13. The year covered by this report will be long remembered, and will be handed down in history to other generations as a year in which India greatly suffered by quite an unusual number of unfortunate events, in fact, there have been, during the year, quite a series of events any one of which was sufficient to make the year a notable one, yet during some period of the year the calamities were all happening at the same time. Famine is the unhappy misfortune that I propose to select, from the series, to put on record a little of the good work that was done to alleviate the distress caused by it in mining

districts. The work and pay in mining districts is so much more abundant and regular that the mining people were not reduced to such great distress as prevailed in the purely agricultural parts of India: in fact, many Mine Owners and Managers appeared to think there was not, ought not to be, any want where there was a coal mine. But large numbers of regular mine workers suffered from dearness of food, failure of the crop that in ordinary years is the source of their principal food-supply, and on which they had spent their all in seed, work, and in wasting anxious thought as the harvest time approached without there being anything on the land to gather. Then, again, many of the dependents of the mining people appear to work and entirely depend on the land for their living. But, notwithstanding all this, I was a little surprised to see such very large numbers of people, both male and female, professing to be in very great want, and right in the centre of large mining districts, and the finding of employment for great numbers of these, as extra and temporary hands, was only a partial relief.

Some little appears to have been done, for the relief of distress brought on by famine, in most of the mining centres, but I believe very little was done in this direction by some of the largest mining companies from which most might have been expected. The relief took several varied forms, and probably the best all-round was that of finding surface employment for those unaccustomed to working below ground. This may involve work being done that, for the time being, is not necessary. But it is often more or less urgent to have advance work in preparation; and cases did happen where the famine facilitated sanction being obtained for necessary and, for the time being, unnecessary advance work that run up the cost per ton of coal, but which will be of the greatest advantage to the collieries during the next few years. The mining people who were at work, and not caused to want by the famine, were in many cases very good to their more needy brethren and workmen, and provided funds for directly feeding the hungry, in addition to their gifts in other ways, and to the general famine funds. A portion of the money so provided at Giridih for feeding the poor and hungry of Giridih, was administered by the Missionary; and those men, women, and grown children that I one day saw receiving from the Missionary rice, dal, and salt, that was sufficient to make a good full meal for one person or a spare meal for two persons, were, apparently, people of the very poorest class, and the bulk of them were undoubtedly in real want, and quite a large proportion would be unable to do any work except it was of the very lightest and easiest kind.

Dr. Saise relates as follows what was done at the East Indian Railway Company's Collieries at Giridih, leaving out the enormous good done in finding work for hundreds who were able to work:—

"Your 28-G. of 26th July. I regret the delay that has occurred."

"During the famine period, February to date, the East Indian Railway Company advanced a sum of ₹ 5,000 with which rice was to be purchased and issued to the workmen at cost price, subject to a minimum issue rate of 9 seers per rupee. Burma rice was largely purchased, and at the end of the period American maize was procured and issued to the people. The total transections amounted to ₹ 77,000: the quantity of rice bought was 684 tons and maize 50 tons. The rice was issued at rates varying from 10½ seers to 9 seers per rupee. During the period of scarcity the bazaar rate of rice varied from 8½ to 6¾ seers per rupee, and this local rice was inferior to the Burma rice in cleanliness. Famine.

The maize was issued at rates varying from 12½ seers to 11¼ seers per rupee.

The people, who are very conservative, did not take either to the rice or the maize at first, but necessity drove them to it, and the result is they like the clean Burma rice, which gives the wife no truble to clean, and the American maize, which is sweeter and

more tasty than the local varieties.

This action of the East Indian Railway Company was equivalent to a rise in wages all round of 22½ per cent.

One hesitates to proclaim one's private acts, but as you ask I will mention that the East Indian Railway employés, Europeans and Natives (down to those drawing ₹15 per month), subscribed a sum of ₹1,200, and from this money 30,000 meals where issued to the poor by the Sonthal Free Church of the Scotland Mission."

Earthquake.

14. I was anxious and somewhat curious as to the effects the earthquake of the 12th of June last (1897) had on the underground workings of the mines and I asked for information, having special reference to the effects on the mines, from a number of mining centres, but have not yet received replies from some of the most important parts of India; so I shall have to postpone my remarks and the results of the enquiry until my next report. I may, in the meantime, state broadly that the earthquake did not much affect the underground workings of the mines. It appears to have had much less effect, and to be less felt below ground than above ground.

## INSPECTION WORK.

15. The following are a few details of some of the inspection work done during the year:—

(1) Clerical work has occupied a large portion of my time during the year, and the whole of it received my close personal attention, every detail being verified by me. Some of the items covered by the term "clerical work" are:—the preparation of annual, ordinary, and special reports; writing letters; acknowledging reports of accidents, and making enquiries with reference to some of the accidents; sending out the pamphlets regarding "Legislation for the Regulation and Sanitation of Mines in India."

(2) The inspection of the mines is in many respects the most important part of my work, and, when one is a very long way from the official centre, and preparations have been made for suitably continuing the inspections, with the mining people full of anxiety and expectation, it is not easy to break off the work and return to head-quarters even though the very intense heat sounds the loud warning note to return. It was under circumstances such as these that the inspection tour of the mines in the Punjab and Baluchistan was continued in the hot weather until near the end of July 1896, with consequences to the health of myself and staff that were bad enough to be a great hindrance to the work for a long time after. Experience will act as a better guide in future. One can scarcely fail to make mistakes that are detrimental to the health when first visiting the Indian mines that are so very far apart and with such very little information as to the scattered and awkward positions of many of the mines. Some of the mines are in positions so difficult to get to that one has to go about the work with very great determination, make the preparations, and then boldly face all difficulties and risks until the work is done. Such was the case when inspecting the scattered small mines, in the Sor range of hills, from Quetta, Baluchistan, in July of 1896. Camels were with difficulty arranged for in Quetta, and a start was made for the mines early on the following morning, and we continued to ride and to walk in

the burning hot sun throughout the whole day, not being able to get the least shelter from a tree or anything else, until we reached the mine we were making for at about 5-30 P. M., and we were urged on the whole day by the fear of not reaching the mine before it was dark. That day's travelling was of itself a great strain to the constitution of one so unaccustomed to riding camels, and there was nothing better than to continue the work and travelling before us, so I was for five consecutive days riding on the camels in the hot sun, walking and climbing up the hill sides, and inspecting the smoky and hot, and in some cases foul smelling mines. And, considering that this work was a continuation of the work of inspecting the coal and the salt-mines in the Punjab, Salt Range, and the coal mines of Khost and Shahrig in Baluchistan, it can, I think, be little wondered at that I contracted attacks of malarial fever that it has been a long and difficult task to break off.

(3) By the Circular, No. $\frac{3}{7\cdot 3}$ of the 24th February 1897, the Government of India asked that "Mine-owners and Managers may be requested to send" me early notice of fatal accidents, so that I may inspect when that appears to be advisable. I have made a number of inspections in compliance with the instructions of that circular, and I believe a great deal of good will be done by these investigations. I look upon the investigation of accidents as one of the most important parts of a mine Inspector's duties, especially when the object is to learn the lessons that every accident is capable of teaching, and so as to prevent similar occurrences happening in the future.

(4) Amongst the special kinds of work that Owners and Managers have asked me to assist them in, and in which, I believe, I have been able to give valuable help, may be mentioned two cases where mining rules were being established for the better working of the mines: a case connected with the appearance of firedamp and the use of safety lamps; another where a mine was on fire; and another a case of standing dangerous water, and trespass, in which three firms were concerned.

(5) In compliance with the instructions in Resolution No. $\frac{10}{7\cdot 10}$ —Geology and Minerals,—dated 9th October 1896, I sent, so far as was possible, a copy of the pamphlet regarding "Legislation for the Regulation and Sanitation of Mines in India" to the Manager of every small mine on my register, and to all Owners or Managers of any mine in India who applied for a copy.

The actual number of copies of the pamphlet sent out was 270. Fourteen of the copies sent out were returned. An effort was made to get revised addresses for the copies returned, and some of the returned copies were sent out again; only 114 of the copies sent out were acknowledged.

(6) The foregoing shows a few of the principal items that found me full employment throughout the year.

There are very many details that would really be too numerous to name with any degree of benefit; and there are many other items of somewhat greater importance, such as going very

carefully over and commenting on Mining Rules for a Foreign State, on the instructions of the Government of India; and the work done at Simla in connection with the proposed legislation for Indian mines.

I think the above will show that there is plenty of work in India for an Inspector of Mines; and I believe there is ample proof that the work is daily growing in importance, and in favour with Owners and Managers of mines. Many of the largest Mine Owners and Managers do not now hesitate to ask for help and information; and I am also thankful to say that they willingly give me any help or information that I may have to ask for.

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | BENGAL PROVINCE. | | | | | | |
| | | | Burdwan Division. | | | | | | |
| | | | *Burdwan District.* | | | | | | |
| | | | Raniganj. | | | | | | |
| 1 | Nimcha | Bengal Coal Co., Ld., Office, Old Court House Street, Calcutta. | Manager, Bengal Coal Co.'s Raniganj mine, Raniganj, E. I. R. | Raniganj sub-division | Raniganj | 4 miles | By riding | Coal | Raniganj. |
| 2 | Searsole | | | | | 2 „ | „ carriage | | |
| 3 | Mudhabpur | Ditto | Ditto | Ditto | Ditto | 4 „ | Ditto | Do. | Ditto |
| 4 | Singaran Valley Colliery. | F. Guyer, Esq. | Manager, Singaran Valley Colliery, Toposi, E. I.R. | Ditto | ? | ..... | ..... | Do. | |
| 5 | Pooranadeep | A. Whyte, Esq. | A. Whyte, Esq., owner of Pooranadeep mine, Raniganj, E. I. R. | Ditto | Raniganj | 5 miles | By carriage | Do. | |
| 6 | Jote Janaki | Raniganj Coal Association, Ld. | Manager, Raniganj Coal Association mine, Toposi, E. I. R. | Ditto | Ditto | 5 „ | Ditto | Do. | Raniganj. |
| 7 | Nundi | Adjai Coal Co. | Manager, Adjai Coal Co.'s Nundi mine, Raniganj, E. I. R. | Ditto | ..... | ..... | ..... | Do. | |
| 8 | Searsole | K. R. Malia and K. D. Malia. | Manager, K. R. and K. D. Malia's Searsole mine, Raniganj, E. I. R. | Ditto | Raniganj | 2 miles | By carriage | Do. | Raniganj. |
| 9 | Jamaria | Ditto | Ditto | Ditto | Raniganj or Kalipahari. | 4 „ | Ditto | Do. | Ditto. |
| 10 | Roghunath Chak | Jagan Nath Marwari | Manager, Jagan Nath Marwari's Roghunath Chak mine, E. I. R. | Ditto | Raniganj | 3 „ | By riding | Do. | |
| | | | | | | 2 „ | „ carriage | | |
| 11 | New Bonbohal | Ditto | Ditto | Ditto | Ditto | ..... | ..... | Do. | |
| 12 | Mithapur | Loki Nath Nundy | Mithapur | Ditto | Ditto or Nandy | 4 miles | Horse or palanquin. | Do. | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | *Munghulpur* | New Berbhoom Coal Co. | Manager, New Beerbhoom Coal Co.'s Munghulpur mine, Raniganj, E. I. R. | Raniganj sub-division | Raniganj | 3 „ | By carriage | Do. | Raniganj. |
| 14 | Bonbohal | Native, Friend & Co. | Manager, Native, Friend & Co.'s Bonbohal mine, Raniganj, E. I. R. | Ditto | Ditto | 10 „ | Ditto | Do. | Ditto |
| 15 | Dubrona | Oodiya Ch. Mundal. Address, 114, Banitola, Hautkola, Calcutta. | Manager, Oodiya Ch. Mundal's Dubrona mine, Raniganj, E. I. R. | Ditto | ..... | ..... | ..... | Do. | Ditto |
| 16 | Mamudpur | H. C. Chongder Guskarah. | Manager, H. C. Chongder Guskarah's Mamudpur mine, Raniganj. | Ditto | ..... | ..... | ..... | Do. | |
| | | | | KALIPAHARI. | | | | | |
| 17 | Ghoosic | Ram Bhundoo Chatterjee | Manager, Ram Bhundoo Chatterjee's Ghoosic mine, Kalipahari, E. I. R. | Raniganj sub-division | Kalipahari | 1 mile | By riding | Do. | Raniganj. |
| 18 | Ditto | Boleram Coal Co., Ghazipur. | Manager, Boleram Coal Co.'s Ghoosic mine, Kalipahari, E. I. R. | Ditto | Ditto | 1 „ | Ditto | Do. | Ditto |
| 19 | Ghoosic (Mosla) | Burdwan Coal Co. | Manager, Burdwan Coal Co.'s Ghoosic mine, Kalipahari, E. I. R. | Ditto | Ditto | 1 „ | Ditto | Do. | Ditto |
| 20 | North Ghoosic | Indian Coal Co. | Manager, Indian Coal Co.'s North Ghoosic mine, Kalipahari, E. I. R. | Ditto | Ditto | 2 miles | ..... | Do. | |
| 21 | Bakulia | Babus Rakhal Das Chakravarti and Bansidhar Laik. | Manager, Bakulia Colliery *via* Sattara. | Bankura district | Kalipahari Railway Station. | 4 „ | Carts | Do. | |
| 22 | West Ghoosic | Babu Hiramba Chandra Pal Chowdhary. | Manager, Hiramba Chandra Pal Chowdhary's West Ghoosic mine, Kalipahari. | Raniganj sub-division | Ditto | 200 yards | Horse | Do. | |
| 23 | Damrah | Damrah Coal Co. | Manager and Proprietor, Damrah Coal Co.'s Damrah mine, Kalipahari, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| 24 | Ghoosic | Ditto | Manager, Damuda Coal Co.'s Ghoosic mine, Starampur, E. I. R. | Ditto | Ditto | 1 mile | By riding | Do. | Raniganj. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | Burdwan Division—*contd.* | | | | | |
| | | | | *Burdwan District*—contd. | | | | | |
| 25 | East Ghoosic | Simon Creet, Esq. | Manager, Mr. Simon Creet's East Ghoosic mine, Kalipahari, E. I. R. | Raniganj sub-division | Kalipahari | ..... | ..... | Coal. | |
| 26 | Chatapathar | Dwarka Nath Khettri | Manager, Dwarka Nath Khettri's Chatapathar mine, Kalipahari, E.I.R. | Ditto | Ditto | 1 mile | By riding or trolly. | Do. | Raniganj. |
| 27 | Nicha | Nadia Coal Co. | Manager, Nadia Coal Co.'s Nicha mine, Kalipahari, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| 28 | Keshubgunge | R. L. Dutta & Co. | Manager, R. L. Dutta & Co.'s Keshubgunge mine, Kalipahari, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| 29 | Ditto | Standard Coal Co. | Manager, Standard Coal Co.'s Keshubgunge mine, Kalipahari, E. I. R. | Ditto | Difto | ..... | ..... | Do. | |
| 30 | Ditto | Poolchand Marwari | Manager, Poolchand Marwari's Keshubgunge mine, Kalipahari, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| 31 | Baghboni | Baghboni Coal Co. | Manager, Baghboni Coal Co.'s Baghboni mine, Kalipahari, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| | | | | Assansol. | | | | | |
| 32 | Charanpore | Messrs. Apcar & Co., 19 Radha Bazar, Calcutta. | Mannger, Messrs. Apcar & Co.'s Charanpore mine, Assansol, E. I. R. | Raniganj sub-division | Assansol | 5 miles | By trolly or private line. | Do. | Assansol. |
| 33 | Bora Chak | Ditto Ditto | Manager, Messrs. Apcar & Co.'s Bora Chak mine, Assansol, E. I. R. | Ditto | Assansol or Sitarampur. | 2 „ | By riding | Do. | Barakar out-post. |
| 34 | Nawadi | Mr. Whyte | Nawadi P. O., Assansol | Ditto | Assansol R. Station, E. I. R. | 4 „ | By horse or palanquin. | Do. | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 35 | Dhadka | New Beerbhoom Coal Co. | Manager, New Beerbhoom Coal Co.'s Dhadka mine, Assansol, E. I. R. | Ditto | Assansol | 2 „ | Ditto | Do. | Assansol. |
| 36 | Ghoosic | Kenchka Coal Co. | Manager, Kenchka Coal Co.'s Ghoosic mine. | Ditto | Kalipahari | ½ mile | Horse | Do. | |
| 37 | Kalipahari | Babu Beni Madhab Mukherjee. | Manager, Beni Madhab Mukherjee's Kalipahari mine, Kusadanga. | Ditto | Ditto | ½ „ | Ditto | Do. | |
| | | | | ASSANSOL. | | | | | |
| 38 | Charanpur | Babu Udoy Chunder Chakravarty. | Manager, Udoy Chunder Chakravarty's Charanpur mine, Charanpur. | Raniganj sub-division | Assansol | 5 miles | Trolly | Do. | |
| 39 | Bakhandi | Babu Lakhy Narain Bose. | Manager, Lakhy Narain Bose's Bakhandi mine, Bakhandi. | Ditto | Ditto | 2 „ | Horse | Do. | |
| 40 | Seebpore | Katras Jherriah Coal Co., Ld. | Manager, Katras Jherriah Coal Co.'s Seebpore mine, Assansol, E. I. R. | Ditto | Ditto | 5 „ | By Coal Co.'s engine or trolly. | Do. | Assansol. |
| 41 | Nandirajpur | Adjai Coal Co. | Nandirajpur | Ditto | Ditto | 7 to 8 miles | Shibpur Branch line and horse or palki. | Do. | |
| 42 | Nandirajpur mine | Babu Khudiram Chakervarti. | Ditto | Ditto | Ditto | 7 to 8 „ | Ditto | Do. | |
| 43 | Jamunia mine | Equitable Coal Co. | Jamunia | Ditto | Ditto | 7 to 8 „ | Ditto | Do. | |
| 44 | Sorakdie | N. A. Hodges, Esq. | Manager, N. A. Hodges' Sorakdie mine, Assansol, E. I. R. | Ditto | Jamunia, Topsi line | 1 mile | ..... | Do. | |
| 45 | Baraboni | New Baraboni Coal Co. | Manager, New Baraboni Coal Co.'s Baraboni mine, Assansol, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| 46 | Old Baraboni | Baraboni Coal Co., Ld. | Manager, Baraboni Coal Co.'s Old Baraboni mine, Assansol, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |
| | | | | SITARAMPUR. | | | | | |
| 47 | Luchipur | Equitable Coal Co., Ld. | Manager, Equitable Coal Co.'s Luchipur mine, Deshurghur. | Raniganj sub-division | Sitarampur (Sataputher). | 3 miles | Horse | Do. | |
| 48 | Sodepore | Bengal Coal Co., Ld. | Manager, Bengal Coal Co.'s Sodepore mine, Sitarampur, E. I. R. | Ditto | Ditto or Barakar | 4 „ | By carriage | Do. | Barakar outpost. |
| 49 | Bara Dhemo | Joint Company | Bara Dhemo | Ditto | Sitarampur, E. I. R. | 2 „ | Horse or palki | Do. | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means avaliable for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | BENGAL PROVINCE—*contd.* | | | | | | |
| | | | Burdwan Division—*contd.* | | | | | | |
| | | | *Burdwan District*—contd. | | | | | | |
| 50 | Luchipur . . | Joint Stock Co. . . | Manager, Joint Stock Co.'s Luchipur mine, Sitarampur, E. I. R. | Raniganj sub-division . | Sitarampur . . | 1 mile . . . | By trolly . . | Coal . . . | Barakar out-post. |
| 51 | Barmonnia . . | Damuda Coal Co. . | Manager, Damuda Coal Co.'s Barmonnia mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 3 miles . . . | ,, riding . . | Do. . . . | Ditto |
| 52 | Damuda . . | Ditto . . . | Manager, Damuda Coal Co.'s Damuda mine, Sitarampur, E. I. R. | Ditto . . . | Ditto or Damuda, B. N. R. | ..... | Ditto . . | Do. . . . | Ditto |
| 53 | Belrooi . . . | New Beerbhoom Coal Co., Ld. | Manager, New Beerbhoom Coal Co's Belrooi mine, Sitarampur, E. I. R. | Ditto . . . | Sitarampur . . | 1 mile . . . | Ditto . . | Do. . . . | Ditto |
| 54 | Luchipur . . | Bholanath Dhur & Co. . | Manager, Bholanath Dhur & Co's Luchipur mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 1 ,, . . . | By trolly . . | Do. . . . | Ditto |
| 55 | Ditto . . | Jaggessur Ray & Co. . | Manager, Jaggessur Ray & Co.'s Luchipur mine, Belrooi, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |
| 56 | Bamandiah . . | Bholanath Dhur & Co. . | Manager, Bholanath Dhur & Co.'s Bamandiah mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 1 mile . . . | By trolly . . | Do. . . . | Barakar out-post. |
| 57 | Ditto . . | Moodun Sodun Roy . | Manager, Moodun Sodun Roy's Bamandiah mine, Belrooi, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |

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| 58 | Salanpore . | The Borrea Coal Co. . | Salanpore Sitarampur Post Office. | Ditto . . . | Ditto, E. I. R. | 4 miles . . | By palki . . | Do. . . . | Assansol outpost, Samdi. |
| 59 | Shibdaspore . . | Ditto . . | Ditto . . | Ditto . . . | Ditto . . | 4½ „ . . . | Ditto . . | Do. . . . | Ditto |
| 60 | Khoodka . . | Ditto . . | Ditto . . | Ditto . . . | Ditto . . | 4 „ . . . | Ditto . . | Do. . . . | Ditto |
| 61 | Rampore . . | Ditto . . | Ditto . . | Ditto . . . | Ditto . . | 4 „ . . . | Ditto . . | Do. . . . | Ditto |
| 62 | Sajkora . . | Ditto . . | Ditto . . | Ditto . . . | Ditto . . | 4 „ . . . | Ditto . . | Do. . . . | Ditto |
| 63 | Bamandiah . . | P. C. Dutt . . . | Manager, P. C. Dutt's Bamandiah mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |
| 64 | Mouthdih . . | Burdwan Coal Co. . | Manager, Burdwan Coal Co.'s Mouthdih mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 3 miles . . | By riding . . | Do. . . . | Barakar outpost. |
| 65 | Sundar Chak . . | Private . . . | Manager, Sundar Chak mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 3 „ . . | „ carriage . . | Do. . . . | Ditto |
| 66 | Neamatpur . . | Joint Stock Co. . . | Manager, Joint Stock Co.'s Neamatpur mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 2 „ . . | „ riding . . | Do. . . . | Ditto |
| 67 | Soodilu . . . | Babu Niroda Prosad Ker and others. | Managar, Niroda Prosad Ker's Soodilu mine, Soodilu. | Ditto . . . | Ditto . . | 1½ „ . . | „ horse . . | Do. | |
| 68 | Khoyrabad . . | Joint Stock Co. . . | Manager, Joint Stock Co.'s Khoyrabad mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 10 „ . . | By private line and trolly. | Do. . . . | Barakar outpost. |
| 69 | Pannuria . . | Ditto . . | Manager, Joint Stock Co.'s Pannuria mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 12 „ . . | By riding or trolly. | Do. . . . | Ditto |
| 70 | Bamandiah . . | D. Khettri . . . | Manager, D. Khettri's Bamandiah mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 3 „ . . | By private line or trolly. | Do. . . . | Ditto |
| 71 | Chota Dhemo . . | Baman Das Mukherji . | Manager, Baman Das Mukherji's Chota Dhemo mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 2 „ . . | By riding . . | Do. . . . | Assansol. |
| 72 | Ditto . . | Ram B. Chatterji . . | Manager, Ram B. Chatterji's Chota Dhemo mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 2 „ . . | Ditto . . | Do. . . . | Ditto |
| 73 | Mouthdih . . | Mouthdih Coal Co. . | Manager, Mouthdih Coal Co.'s Mouthdih mine, Sitarampur, E. I. R. | Ditto . . . | Ditto . . | 3 „ . . | Ditto . . | Do. . . . | Barakar outpost. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | BENGAL PROVINCE—*contd.* | | | | | | |
| | | | BURDWAN DIVISION—*concld.* | | | | | | |
| | | | *Burdwan District*—concld. | | | | | | |
| | | | BARAKAR. | | | | | | |
| 74 | Mouthdih | Jadu Gopal Chatterji | Manager, Jadu Gopal Chatterji's Mouthdih mine, Sitarampur, E. I. R. | Raniganj Sub-division | Sitarampur | 3 miles | By riding | Coal | Barakar out-post. |
| 75 | Chota Dhemo | Laik & Co. | Manager, Laik & Co.'s Chota Dhemo mine, Sitarampur, E. I. R. | Ditto | Ditto | 2 „ | Ditto | Do. | Assansol. |
| 76 | Mouthdih | Gopal Chandra Mitra | Manager, Gopal Chandra Mitra's Mouthdih mine, Sitarampur, E. I. R. | Ditto | Ditto | 3 „ | Ditto | Do. | Barakar out-post. |
| 77 | Raghunathbati | C. F. Lial, Esq. | Raghunathbati, P. O. Sitarampur, Burdwan. | Ditto | Sitarampur R. Station, E. I. R. | 2 „ | By horse or palanquin. | Do. | |
| 78 | Bara Dhemo | Ragu Nandan Prosad Pronia. | Bara Dhemo, P. O. Sitarampur. | Ditto | Ditto | 1½ „ | Ditto | Do. | |
| 79 | Antonia and Kendua | Bengal Iron and Steel Co., Ld. | Manager, Bengal Iron and Steel Co.'s Antonia and Kendua mine, Sitarampur, E. I. R. | Ditto | Barakar | 1 mile | By riding | Do. | Barakar out-post. |
| 80 | Desherghur | Equitable Coal Co., Ld. | Manager, Equitable Coal Co.'s Desherghur mine, Barakar, E. I. R. | Ditto | Ditto | 3 miles | „ carriage | Do. | Ditto |
| 81 | Sanctoria | Bengal Coal Co., Ld. | Manager, Bengal Coal Co.'s Sanctoria mine, Barakar, E. I. R. | Ditto | Ditto | 3 „ | Ditto | Do. | Ditto |
| 82 | Laikdi | Ditto | Manager, Bengal Coal Co.'s Laikdi mine, Barakar, E. I. R. | Ditto | Ditto | ..... | ..... | Do. | |

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| 83 | Borrea . . . | New Beerbhoom Coal Co., Ld. | Manager, New Beerbhoom Coal Co.'s Borrea mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |
| 84 | Bagunia . . | R. H. Scorer, Esq. . | Manager, Mr. R. H. Scorer's Bagunia mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | 1 mile . . . | By carriage . | Do. . . . | Barakar outpost. |
| 85 | Kumardubi . . | Barakar Coal Co., Ld. . | Manager, Barakar Coal Co 's Kumardubi mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |
| 86 | Gangootiya . . | Bengal Nagpur Coal Co., Ld. | Manager, Bengal Nagpur Coal Co.'s Gangootiya mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | 4 miles . . | By riding . . | Do. . . | Barakar outpost. |
| 87 | Bagunia . . | Benori Lal Mukerji . | Manager, Benori Lal Mukerji's Bagunia mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |
| 88 | Ditto . . . | Laik Coal Co. . . | Manager, Laik Coal Co.'s Bagunia mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | 1 mile . . . | By carriage . | Do. . . | Barakar outpost. |
| 89 | Ditto . . . | Nundo Lal Garia . | Manager, Nundo Lal Garia's Bagunia mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | 1 „ . . . | Ditto . . | Do. . . | Ditto. |
| 90 | Ditto . . . | Jogendra Nath Mukherji | Manager, Jogendro Nath Mukherji's Bagunia mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | 1 „ . . . | Ditto . . | Do. : . | Ditto. |
| 91 | Ditto . . . | Deni M. Sandal . . | Manager, Deni M. Sandal's Bagunia mine, Barakar, E. I. R. | Ditto . . . | Ditto . . | ..... | ..... | Do. | |
| | | | | TOPSI. | | | | | |
| 92 | Chhora . . . | Ondal Coal Syndicate . | Manager, Ondal Coal Syndicate, Chhora Mine. | Raniganj Sub-division . | Topsi . . . | 3 miles . . . | Horse . . | Do. | |
| | | | | ONDAL. | | | | | |
| 93 | Narsamuda . . | Sitarampur Coal Co, Mr. Whyte. | Narsamuda, Post Office Assansol, Burdwan. | Raniganj Sub-division . | Ondal Railway station. | 4 miles . . . | By horse or palanquin. | Do. | |
| 94 | Kadma . . | Syamlal Pal . . . | Kodma, Post Office Assansol, Burdwan. | Ditto . . . | Ditto . . | 4 „ . . . | ..... | Do. | |
| 95 | West Baraboni . | West Baraboni Coal Co. | Baraboni, Raniganj Subdivision. | Ditto . . . | Domobani . . | 1 mile . . . | Horse or palanquin | Do. | |

| No | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | EURDWAN DIVISION—*contd.* | | | | | |
| | | | | *Hazaribagh District*—contd. | | | | | |
| | | | | ONDAL—*contd.* | | | | | |
| 96 | Bhas Kajari | Kenaram Barman | Baraboni | Raniganj Sub-division | Domobani | 2 miles | By horse or palanquin. | Coal | |
| 97 | Joyramdanga | New Birbhum Coal Co. | Joyramdanga | Ditto | Ditto | 2 „ | Ditto | Do. | |
| 98 | Bhanarda | Bonowari Mukherji | Bhanarda. Post Office Charanpur. | Ditto | Domoboni Railway Station. | 1 mile | Ditto | Do. | |
| | | | | *Daling District.* | | | | | |
| 1 | Daling Colliery | Private Syndicate | Octavius Steel and Co., 14, Old Court House Street, Calcutta. | Daling Sub-division | Dam Din, B. D. Railway; Siliguri, N. B. Railway. | 12 miles from Dam Din and 22 miles from Siliguri. | Carts and pack traffic. | Coal. | |
| | | | | CHOTA NAGPUR DIVISION. | | | | | |
| | | | | *Hazaribagh District.* | | | | | |
| | | | | GIRIDIH | | | | | |
| 1 | Kurhurbari | E. I. Railway Co. | Manager, E I. Railway Co.'s Collieries, Giridih, E. I. R. | Giridih, Sub-division Giridih. | Giridih | 2 miles | By push-push | Coal. | |
| 2 | Serampur | Ditto | Ditto | | | 3 „ | | | |
| 3 | Kuldiah | Bengal Coal Co. | Manager, Bengal Coal Co., Ld., Giridih, E. I. R. | | | 3 „ | | | |
| 4 | Kamaljare | Giridih Colliery Co., Ld. | Manager, Giridih Colliery Co., Ld., Giridih, E I. R. | | | 3 „ | | | |
| 5 | Choonjka | Raniganj Coal Association, Ld. | Manager, R. C. Association, Giridih, E. I. R. | | | 4 „ | | | |
| 6 | Bayra | Mr. E. Myers | Mr. E. Myers, Giridih, E. I. R. | | | 2½ „ | | | |

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| 1 | Bhadarya | Messrs F. F. Chrestien & Co. | Tisri *vid* Bhurai Post Office. | Village Mahapur, village Jaipur or Chittarpur in Koderma, Sub-division Giridih. | Giridih | 60 miles | By palki-bearers or push-push. | Mica | Mines numbered 1, 2, 7, 10, 13 and 14 were not included in any of the returns for 1895. |
| 2 | Ghararia | | | | | | | | |
| 3 | Meghatori *alias* Charki. | | | | | | | | |
| 4 | Lalki | | | | | | | | |
| 5 | Lookya Singa | | | | | | | | |
| 6 | Pathalhia | | | | | | | | |
| 7 | Taraghatia | | | Village Mahapur or Karharia in Koderma, Sub-division Giridih. | | | | | |
| 8 | Penraria | | | | | | | | |
| 9 | Hudhudwa | | | | | | | | |
| 10 | Karuantar | | | | | | | | |
| 11 | Sidwatand | | | | | | | | |
| 12 | Lootpahari | | | | | | | | |
| 13 | Charkipahari | | | | | | | | |
| 14 | Bajarhari | | | | | | | | |
| 15 | Satwa Khad | Babu Raj Krishna Sahana. | Village Moglamarun in Koderma. | Sub-division Giridih | Giridih, E. I. R. | 60 „ | Ditto | Do. | |
| 16 | Karipathai | | | | | | | | |
| 17 | Latgodwa | | | | | | | | |
| 18 | Mohchichya | | | | | | | | |
| 19 | Safakhad | | | | | | | | |
| 20 | Mohuria | | | | | | | | |
| 21 | Jatahi Khad | | | | | | | | |
| 22 | Salahi | | | | | | | | |
| 23 | Satanrati | | | | | | | | |
| 24 | Sewa | Ditto ditto | Baratand in Koderma | Police-station Koderma, Sub-division Giridih. | Ditto | 60 „ | Ditto | Do. | |
| 25 | Satanrati | | | | | | | | |
| 26 | Jamdaha | | | | | | | | |
| 27 | Mowatand | | | | | | | | |
| 28 | Paproo | | | | | | | | |
| 29 | Sirsiria | | | | | | | | |
| 30 | Paparia | | | | | | | | |
| 31 | Sarlahi | | | | | | | | |
| 32 | Barakola | | | | | | | | |
| 33 | Lachmania | | | | | | | | |
| 34 | Teshra Khad | | | | | | | | |
| 35 | Hataria | | | | | | | | |
| 36 | Katahia | | | | | | | | |
| 37 | Sutua Khad | | | | | | | | |
| 38 | Baraharsa Khad | | | | | | | | |
| 39 | Kudra Katwa | | | | | | | | |
| 40 | Pasra Khad | | | | | | | | |
| 41 | Harbaria Khad | | | | | | | | |
| 42 | Basra Khad | | | | | | | | |
| 43 | Mehsoda | W. R. Macdonald, Esq. | Koderma | Baratand in Koderma Police station, Sub-division Giridih. | Ditto | 60 „ | Ditto | Do | |
| 44 | Mohsalia | | | | | | | | |
| 45 | Gamaria | | | | | | | | |
| 46 | Ghootia | | | | | | | | |
| 47 | Satalrati | | | | | | | | |
| 48 | Barataktahia | | | | | | | | |
| 49 | Sarlohi | | | | | | | | |
| 50 | Dhaki Mohua | | | | | | | | |
| 51 | Chirchiria | | | | | | | | |
| 52 | Barharia | | | | | | | | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | CHOTA NAGPUR DIVISION—*contd.* | | | | | |
| | | | | *Hazaribagh District*—contd. | | | | | |
| 53 | Showltia | | | | | | | | |
| 54 | Sabarki | | | | | | | | |
| 55 | Ghogsahi | W. R. Macdonald, Esq. | Koderma | Village Jaipur in Koderma, Sub-division Hazaribagh. | Giridih, E. I. R. | 60 miles | By palki-bearers or push-push. | Mica. | |
| 56 | Nankibhuti | | | | | | | | |
| 57 | Lokaiya | | | | | | | | |
| 58 | Lomechanchi | | | | | | | | |
| 59 | Sijna | W. Noble, Esq. | Ditto | Village Kakokudar in Koderma. | ... | ... | ... | ... | |
| 60 | Billna | | | | | | | | |
| 61 | Goura Moron | | | | | | | | |
| 62 | Kadootia | W. D. Clyburn, Esq. | Ditto | Taraghati | | | | | |
| 63 | Kesma Khad | | | | | | | | |
| 64 | Taraghatirate | | | | | | | | |
| 65 | Soti | | | Baudidera | | | | | |
| 66 | Sabrahi | | | | | | | | |
| 67 | Piprutia Khad | | | | | | | | |
| 68 | Koonda | | | Alukdiha | | | | | |
| 69 | Charki | | | | | | | | |
| 70 | Beharattari | | | Kakokudar, in Koderma police-station. | | | | | |
| 71 | Digha Khad | | | | | | | | |
| 72 | Bootaria | | | | | | | | |
| 73 | Burhia | | | Jaipur — Koderma police-station, sub-division Hazaribagh. | | | | | |
| 74 | Inderwa | | | Inderwa — Koderma police-station, sub-division Hazaribagh. | Giridih, E. I. R. | 60 miles | By palki-bearers or push-push. | Mica. | |
| 75 | Hudhudwa | | | Dharam | | | | | |
| 76 | Natkanwa | | | | | | | | |
| 77 | Baria | | | Champadih | | | | | |
| 78 | Peprahi | | | | | | | | |
| 79 | Taraghati | | | Taraghati | | | | | |
| 80 | Lalki | | | | | | | | |
| 81 | Khanghia | | | | | | | | |
| 82 | Langra Para | | | Jamsoti | | | | | |
| 83 | Rohai | | | | | | | | |
| 84 | Pathalgadwa | | | | | | | | |
| 85 | Surangi | | | Kalipahri *alias* Muglamarun. | | | | | |
| 86 | Pamhoia | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 87 | Bathania | | | Muglamarun | | | | |
| 88 | Kori | | | | | | | |
| 89 | Chirchiria | | | | | | | |
| 90 | Daghai | | | Baratand, in Koderma police-station, Sub-division Hazaribagh. | | | | |
| 91 | Satalrati | | | | | | | |
| 92 | Mahagaya | | | | | | | |
| 93 | Paisara | | | | | | | |
| 94 | Burha | | | | | | | |
| 95 | Bhadaria | | | | | | | |
| 96 | Kararia | | | | | | | |
| 97 | Pamhia | | | | | | | |
| 98 | Suarlite | | | Police-station, Koderma police-station, Sub-division Hazaribagh. | | | | |
| 99 | Gamaria | | | | | | | |
| 100 | Kaharia | | | | | | | |
| 101 | Murlipahari | | | | | | | |
| 102 | Aglagua | | | | | | | |
| 103 | Thanahia | | | | | | | |
| 104 | Jhagrahia | | | | | | | |
| 105 | Bhutahi | | | | | | | |
| 106 | Nakatia | | | | | | | |
| 107 | Seathoa | | | | | | | |
| 108 | Karipahri | | | | | | | |
| 109 | Tekoa | | | | | | | |
| 110 | Khairoatari | | | | | | | |
| 111 | Galgohla | Messrs. F. F. Chrestien & Co. | Tisri *vid* Bhurai Post Office. | | Giridih | 60 „ | Ditto | Do. |
| 112 | Lasigua | | | | | | | |
| 113 | Bhalagi | | | Baratand, in Koderma police-station, Sub-division Hazaribagh. | | | | |
| 114 | Bhari | | | | | | | |
| 115 | Morgoa | | | | | | | |
| 116 | Sugoa | | | | | | | |
| 117 | Hatiaria | | | | | | | |
| 118 | Hookaparon | | | | | | | |
| 119 | Naktahia | | | | | | | |
| 120 | Lalki | | | | | | | |
| 121 | Kutkutua | | | | | | | |
| 122 | Sarlahia | | | | | | | |
| 123 | Lomchanchi | | | | | | | |
| 124 | Bhusbhuswa | | | | | | | |
| 125 | Pattahia | | | | | | | |
| 126 | Angarchaga | | | | | | | |
| 127 | Dakahia | | | | | | | |
| 128 | Khos Dangarkutia | | | | | | | |
| 129 | Dudhpania | | | | | | | |
| 130 | Baroa | | | | | | | |
| 131 | Harwa | | | Kakokudar, Koderma police-station, Sub-division Hazaribagh. | | | | |
| 132 | Baria Khad | | | | | | | |
| 133 | Tamahi | | | | | | | |
| 134 | Pamahi | | | | | | | |
| 135 | Sujimahudar | | | | | | | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company | Situation of mine—State, Province, Division, Sub-division, or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | CHOTA NAGPUR DIVISION—*contd.* | | | | | |
| | | | | *Hazaribagh District*—contd. | | | | | |
| 136 | Nilwadaha | | | Kakokudar, Koderma Police-station, Sub-division Hazaribagh. | | | | | |
| 137 | Bhadorio | | | | | | | | |
| 138 | Sugi Pahar | | | | | | | | |
| 139 | Pathalhia | | | | | | | | |
| 140 | Bagolia | | | | | | | | |
| 141 | Park Pahar | | | | | | | | |
| 142 | Desurwa | | | | | | | | |
| 143 | Durbashwa | | | | | | | | |
| 144 | Bhandodiha | | | | | | | | |
| 145 | Baroa | | | | | | | | |
| 146 | Guthali | | | | | | | | |
| 147 | Fatrahi | | | | | | | | |
| 148 | Pattahia | Messrs F. F. Chrestien & Co. | Tisri *vid* Bhurai post office. | Village Meghatari | Giridih | 60 miles | By palki-bearers or push-push. | Mica. | |
| 149 | Meghatari | | | Bhisumtikar | | | | | |
| 150 | Bhisumtikar | | | Bishenpur | | | | | |
| 151 | Bishenpur | | | Simratari | | | | | |
| 152 | Samratari | | | Mohuatand | | | | | |
| 153 | Mohuatand | | | Khalakthambi | | | | | |
| 154 | Khalakthambi | | | Sidwatand in Koderma | | | | | |
| 155 | Sidwatand | | | Karamtand in Koderma | | | | | |
| 156 | Karamtand | | | Dharam | | | | | |
| 157 | Dharam | | | Champadih | | | | | |
| 158 | Champadi | | | Kaharia | | | | | |
| 159 | Karharia | | | Sapaha | | | | | |
| 160 | Sapaha | | | Jangal Sikar (Koderma R F.) | | | | | |
| 161 | Jangal Sirkar | | | | | | | | |
| 162 | Jatahi | Babu Raj Krishna Sahana. | Koderma | Maglamarun in Koderma Police-station. | Ditto | 60 „ | Ditto | Do. | |
| 163 | Haraia | | | | | | | | |
| 164 | Charkapathal | | | | | | | | |
| 165 | Barwadih | C. A. Dickson, Esq. | Ditto | Ditto | Ditto | 60 „ | Ditto | Do. | |
| 166 | Paprewa | | | | | | | | |
| 167 | Salaia | | | | | | | | |
| 168 | Panihia | | | | | | | | |
| 169 | Dandhy | | | | | | | | |
| 170 | Aoroa | | | | | | | | |
| 171 | Pakhbahia | | | | | | | | |
| 172 | Basaria | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|
| 173 Kusumbha<br>174 Lakmandua<br>175 Larlarwa<br>176 Subrahia<br>177 Mitkabil<br>178 Tejira<br>179 Naodi<br>180 Latweya<br>181 Sissirwa<br>182 Bushuswa<br>183 Amda<br>184 Dhanapahari<br>185 Rama | W. R. Macdonald, Esq., or his Agent. | Koderma | Koderma police station | Ditto | 60 miles | Ditto | Do. | |
| 186 Dharwai Pahari | Babu Beharilal Gossain | Gawan | Gawan, Sub-division Giridih. | Ditto | About 40 miles | Ditto | Do. | |
| 187 Bedro<br>188 Gookoorah | Messrs. F. F. Chrestien & Co. | Tisri *viâ* Bhurai post office. | Gawan police-station, Sub-division Giridih. | Ditto | „ 40 „ | Ditto | Do. | |
| 189 Machwa or Madhua Pahari. | Tekaetni of Doranda | Doranda | Doranda police-station, Dhamar. | Ditto | 20 miles | Ditto | Do. | |
| 190 Simeria<br>191 Kajerodih | Babu Jowahir Moll | Koderma | | | | | | |
| 192 Masnudih | Messrs. F. F. Chrestien & Co. | Tisri *viâ* Bhurai | Koderma police-station, Sub-division Hazaribagh. | Ditto | About 50 miles | Ditto | Do. | These mines numbered 200 to 205 inclusive were not included in any of the returns for 1895. |
| 193 Doondbar<br>194 Pemia<br>195 Domechanch | Toofani Singh<br>Narni Dass<br>Messrs F. F. Chrestien and Company. | Koderma<br>Ditto<br>Tisri *viâ* Bhurai | | | | | | |
| 196 Koderma Khas<br>197 Badur Chua<br>Loomeria<br>198 Paprewa<br>199 Chirkipukal | W. R. Macdonald, Esq., or his Agent. | Koderma | Village Kakokudar, Koderma police-station, Sub-division Hazaribagh. | Ditto | „ 20 „ | By push-push | Do. | |
| 200 Sariltiya<br>201 Bhurai | W. C. Clyburn, Esq. | Ditto | Ditto | Ditto | „ 20 „ | Ditto | Do. | |
| 202 Phoottye | J. Hampton, Esq. | Ditto | Village Inderwa, in Koderma police-station, Sub-division Hazaribagh | Ditto | „ 20 „ | Ditto | Do. | |
| 203 Burra Sujma<br>204 Chota Sujma<br>205 Dagia | E. Cox, Esq. | Ditto | In Koderma police-station | Ditto | „ 20 „ | Ditto | Do. | |
| 206 Kajrahdah<br>207 Gambharia<br>208 Paprywa<br>209 Chirkipakal | W. Noble, Esq. | Ditto | Village Kakokudar, Koderma police-station. | Ditto | „ 20 „ | Ditto | Do. | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | CHOTA NAGPUR DISTRICT—*contd.* | | | | | |
| | | | | *Hazaribagh District*—concld. | | | | | |
| 210 | Bootaria Burra | Gopi Nath Bysack | Domchanch | Village Kakokudar, Koderma police-station. | Giridih | About 20 miles | By push-push | Mica. | |
| 211 | „ Chota | | | | | | | | |
| 212 | Tantaria | | | | | | | | |
| 213 | Panjoto | | | | | | | | |
| 214 | Shewali | | | | | | | | |
| 215 | Jaipur | Messrs. F. F. Chrestien & Co. | Tisrí *vid* Bhurai post office. | In Koderma police-station | Ditto | „ 20 „ | Ditto | Do. | |
| 216 | Chitrapur | | | | | | | | |
| 217 | Lukia | | | | | | | | |
| 218 | Baratand | | | | | | | | |
| 219 | Sobraki | | | In Kakokudar in Koderma police-station. | Ditto | „ 20 „ | Ditto | Do. | |
| 220 | Nilowa | W. D. Clyburn, Esq. | Baghitand, Koderma | | | | | | |
| 221 | Lalki | | | In Surangi in Koderma police-station. | Ditto | „ 20 „ | Ditto | Do. | |
| 222 | Satra | | | | | | | | |
| 223 | Sobrati | | | In village Maglamarun in Koderma police-station. | Ditto | „ 20 „ | Ditto | Do. | |
| 224 | Mahuaria | | | | | | | | |
| 225 | Dhaja | E. Cox, Esq. | Koderma | In Koderma police-station | Ditto | „ 20 „ | Ditto | Do. | |
| 226 | Paprua | A. M. Gow Smith, Esq. | Ditto | Sub-division Govindpur | Ditto | 60 miles | By palki-bearers or push-push. | Do. | |
| 227 | Saria | | | | | | | | |
| 228 | Haria | | | | | | | | |
| 229 | Shoneta | | | | | | | | |
| 230 | Gambharia | | | | | | | | |
| 231 | Kendua | | | | | | | | |
| 232 | Hadhadua | | | | | | | | |
| 233 | Bhumaria | | | | | | | | |
| 234 | Barumsata | | | | | | | | |
| 235 | Jharva | | | | | | | | |
| 236 | Chulki Baghi | | | | | | | | |
| 237 | Kanja Latu | Messrs. Atkinson Brothers. | Ditto | Sub-division Giridih | Giridih, E. I. R. | 60 „ | Ditto | Do. | Thana Giridih. |

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| 238 | Katharia | Babu Raj Krishna Sahana. | Ditto | Sudder Sub-division | Ditto | 60 „ | Ditto | Do. | |
| 239 | Shamshara | | | | | | | | |
| 240 | Banaria | | | | | | | | |
| 241 | Shakia | | | | | | | | |
| 242 | Haria | | | | | | | | |
| 243 | Basharia | | | | | | | | |
| 244 | Mararia | | | | | | | | |
| 245 | Koshana | | | | | | | | |
| 246 | Kanahia | | | | | | | | |
| 247 | Fooltai | | | | | | | | |
| 248 | Dhowakhad | | | | | | | | |
| 249 | Khumukkhad | | | | | | | | |
| 250 | Mahuwakhad | | | | | | | | |
| 251 | Mooraria | | | | | | | | |
| 252 | Tandria | | | | | | | | |
| 253 | Jhorma | E. W. Hetto, Esq. | Dhanwar | Sub-division Giridih | Ditto | 20 „ | Ditto | Do. | Thána, Dharwar. |
| 254 | Asokoorha | Mr. Looti | Karakdiha | Ditto | Ditto | Over 20 miles | Ditto | Do. | Thana Kharakdiha. |
| 255 | Gonaipur | | | | | | | | |
| 256 | Charkapathal | Ditto | Ditto | Ditto | Ditto | About 20 „ | Ditto | Do. | Ditto. |
| 257 | Tolo Tand | | | | | | | | |
| 258 | Salbahiar | Kali Prosona Babu | Ditto | Ditto | Ditto | „ 20 „ | Ditto | Do. | Ditto. |
| 259 | Bachakandhey | | | | | | | | |
| 260 | Modhania | Messrs. F. F. Chrestien & Co. | Tisri Bhurai Post Office. | Ditto | Ditto | „ 20 „ | Ditto | Do. | Ditto. |
| 261 | Khirkiuria | | | | | | | | |
| 262 | Delbia | | | | | | | | |
| 263 | Nazdi | | | | | | | | |
| 264 | Kalwa Pahari | Bhagwatt Babu | Gawan | Ditto | Ditto | Over 40 miles | Ditto | Do. | Thana Gawan. |
| 265 | Madhania | Pachkori Babu | | | | | | | |
| 266 | Dabar | Dr. Saise | | | | | | | |
| 267 | Suva Dhab | Choora Mal | | | | | | | |
| 268 | Barwadit | Tincouri Babu | | | | | | | |
| 269 | Katkako | Messrs. F. F. Chrestien & Co. | Tisri Bhurai Post Office. | | | | | | |
| 270 | Rajpoora | | | | | | | | |
| 271 | Chirki | | | | | | | | |
| 272 | Ghograh | | | | | | | | |
| 273 | Dhapahat | | | | | | | | |

*Manbhum District.*

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|---|---|---|---|---|---|---|---|---|---|
| 1 | Mugma mine | Rama Nath Bhuttacharjee. | Syampur, police-station Nirsha. | Mugma, Govindpur Sub-division. | Barakar Station | 2 miles | Palki | Coal. | |
| 2 | Rajpura mine | Shosi Bhusan Gossami | Rajpura, police-station Nirsha. | Rajpura, Govindpur Sub-division. | Barakar | 4 „ | Ditto | Do. | |
| 3 | Ditto | Sambhu Nath Roy | Kapasara Chirkunda, Police-station Nirsha. | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 4 | Ditto | Rohini Kumar Rai | Barakar | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 5 | Ditto | Dariyao Khan, Kaboli (dead). | Rajpura, police-station Nirsha. | Ditto | Ditto | 4 „ | Ditto | Do. | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | CHOTA NAGPUR DIVISION—*contd.* | | | | | |
| | | | | *Manbhoom District*—contd. | | | | | |
| 6 | Rajpura mine . | Siristidhar Mukerji . | Rajpura, police-station Nirsha. | Rajpura, Govindpur Sub-division | Barakar . . | 4 miles . . . | Palki . . . | Coal. | |
| 7 | Chattataur mine . | Sital Chandra Set . | Chattataur, police-station Nirsha. | Ditto . . . | Ditto . . . | 3 „ . . . | Ditto . . . | Do. | |
| 8 | Pandedi mine . | Pandedi Coal Company. | Pandedi, police-station Nirsha. | Pandedi, Govindpur Sub-division. | Kalubatham . . | 2 „ . . . | Ditto . . . | Do. | |
| 9 | Hatibari mine . | Hatibari Coal Company. | Hatibari, police-station Nirsha. | Hatibari, Govindpur Sub-division. | Nirsha police-station | 1 mile . . . | Ditto . . . | Do. | |
| 10 | Agaya Birsingpur . | East Indian Coal Company. | Charuinala, post office and police-station Nirsha | Agaya Birsingpur, Govindpur Sub-division | Ditto . . . | 2 miles . . . | Ditto . . . | Do. | |
| 11 | Pitakeyari mine . | Prasanna Kumar Rai . | Ditto . . . | Pitakeyari Govindpur Sub-division, | Ditto . . . | ½ mile . . . | Ditto . . . | Do. | |
| 12 | Ketardihi mine . | Ishan Chunder Ghose . | Kaldi, Barakar, police-station Nirsha. | Kedardihi, Govindpur Sub-division. | Ditto . . . | 6 miles . . . | Ditto . . . | Do. | |
| 13 | Sangamahul mine | Say Nath Banerji . | Sangamahul, police-station Nirsha. | Sangamahul, Govindpur Sub-division. | Ditto . . . | 4 „ . . . | Ditto . . . | Do. | |
| 14 | Kanadi Bhalber mine | Ram Lal De . . | Calcutta, Chunagali, house No. 8. | Kanadi, Bhalber . . | Ditto . . . | 8 „ . . . | Ditto . . . | Do. | |
| 15 | Patlabari . . | South Barakar Coal Company. | Calcutta, and Patlabari, Barakar. | Patlabari, Govindpur Sub-division. | Barakar . . | 4 „ . . . | Palki or cart . | Do. | |
| 16 | Tantikanali mine . | Bengal Coal Company . | Tantikanali . . . | Govindpur Sub-division | Ditto . . . | 2 „ . . . | Ditto . . | Do. | |
| 17 | Dhankura mine . | Ditto . . | Ditto, Tantikanali, Barakar. | Dhankura, Govindpur Sub-division. | Ditto . . . | 2 „ . . . | Ditto . . | Do. | |
| 18 | Kumardubi mine . | Barakar Coal Company | Tantikanali, Barakar . | Kumardubi . . | Ditto . . . | 2 „ . . . | Ditto . . | Do. | |
| 19 | Igarkur mine . . | Haradhon Layek . . | Sodhpur, police-station Assansol. | Egarkur, Govindpur Sub-division. | Ditto . . . | 3 „ . . . | Ditto . . | Do. | |
| 20 | Ditto . . | Umesh Bhuttacharji . | Mankar, police-station Bud-bud, district Burdwan. | Ditto . . . | Ditto . . . | 3 „ . . . | Ditto . . | Do. | |
| 21 | Ditto . . | Umesh Chundra Roy . | Chirkunda, police-station Bud-bud, district Burdwan. | Ditto . . . | Ditto . . . | 3 „ . . . | Ditto . . | Do. | |
| 22 | Ditto . . | Surendra Nath Layek . | Begunia, district Burdwan. | Ditto . . . | Ditto . . . | 3 „ . . . | Ditto . . | Do. | |
| 23 | Ditto . . | Krishna Chundra Madak | Chirkunda . . . | Ditto . . . | Ditto . . . | 3 „ . . . | Ditto . . | Do. | |

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| 24 | Ditto | Jadu Gopal Chatterjee | Kalipahari, police-station Nirsha. | Ditto | Ditto | 3 „ | Ditto | Do. |
| 25 | Coal mine | Mr. J. Deveria | Purulia | Monkurah, Raghunathpur. | Damodar station | 3 „ | Ditto | Do. |
| 26 | Sijna mine | Finlay, Muir & Co. | Sijna, Ragan | Village Sijna, Gobindpur Sub-division. | Katras station, Jharia Extension, E. I. R. | 1½ „ | Ditto | Do. |
| 27 | Angarpatra mine | Radhanath Trigunait | Malikara, police-station Topechanchi. | Village Angarpatra | Ditto | ½ mile | Ditto | Do. |
| 28 | Ditto | Nagendra Chundra Mitra | Malikara, police-station Topechanchi, Mahata, Burdwan. | Village Angarpatra, Gobindpur Sub-division. | Ditto | ½ „ | Ditto | Do. |
| 29 | Ditto | Jogendra Nath Srimany | Malikara, police-station Topechanchi, Calcutta, 40-2, Baranasi Ghose's Street. | Ditto | Ditto | ½ „ | Ditto | Do. |
| 30 | Kendadi mine | East Indian Coal Company. | Kendadi, police station Jharia. | Kendadi | Dhanbad station | ½ „ | Ditto | Do. |
| 31 | Khoyra mine | Ditto | Kendadi, police-station Jharia, Assansol, Burdwan. | Khoyra | Ditto | 5 miles | Ditto | Do. |
| 32 | Borari mine | Ditto | Ditto | Borari, Gobindpur Sub-division. | Ditto | 2 „ | Ditto | Do. |
| 33 | Bhakati | Bengal Nagpur Coal Company. | Bhakati, police-station Jharia. | Bhakati, Gobindpur Sub-division. | Ditto | 1 mile | Ditto | Do. |
| 34 | Parur Kanalti mine | Bhaja Dhanji Kachhi | Fatehpur, police-station Jharia. | Parur Kanalti, Gobindpur Sub-division. | Jharia police-station | 4 miles | Ditto | Do. |
| 35 | Bhaga mine | Ditto | Ditto | Fatehpur, Gobindpur Sub-division. | Ditto | 2 „ | Ditto | Do. |
| 36 | Sudamdi mine | Deosi Hirji Kachhi | Sudamdi, police-station Jharia. | Sudamdi, Gobindpur Sub-division. | Ditto | 6 „ | Ditto | Do. |
| 37 | Sutikdi mine | Bengal Nagpur Coal Company. | Joyalgora, police-station Jharia. | Sutikdi, Gobindpur Sub-division. | Ditto | 6 „ | Ditto | Do. |
| 38 | Angarpattra | Mohabir Prosad | Katras | Gobindpur Sub-division | Katras station, Jharia Extension. | ½ mile | Palki | Do. |
| 39 | Ditto | Bistoo Chandra | Ditto | Ditto | Ditto | ½ „ | Ditto | Do. |
| 40 | Boragar | Gopal Chandra Bhattacharjee. | Boragar, Jharia | Ditto | Jharia police-station | 2 miles | Ditto | Do. |
| 41 | Bhastakola | Birbhum Coal Company | Bhastakola, Jharia | Ditto | Dhanbad station | 2 „ | Ditto | Do. |
| 42 | Bansrya | Mr. J. M. Derby | Bansrya | Ditto | Ditto | 2 „ | Ditto | Do. |
| 43 | Bhandudi | Katras Jharia Coal Company, Ld. | Manager, F. S. Cook, Esq., Panchgori. | Ditto | Katras station | ½ mile | Ditto | Do. |
| 44 | Brindabanpur | Baktas Marwari | Brindabanpur | Ditto | Nirsha police-station | 3 miles | Ditto | Do. |
| 45 | Chattabad | Katras Jharia Coal Company, Ld. | Manager, F. S. Cook, Esq., Panchgoria | Ditto | Katras station | ½ mile | Ditto | Do. |
| 46 | Chaitudi | Ditto | Ditto | Ditto | Ditto | ½ „ | Ditto | Do. |
| 47 | Chitahi | Chitahi Coal Company | Chitahi | Ditto | Ditto | 1 „ | Ditto | Do. |
| 48 | Dobari | Sosi Bhusan Banerjee | Dorbari, Jharia | Ditto | Jharia police-station | 1 „ | Ditto | Do. |
| 49 | Egarkur | Nanda Gorrain | Chirkunda | Ditto | Barakar station | 3 miles | Ditto | Do. |
| 50 | Fatehpur | Bhaju Kachi | Fatehpur, Jharia | Ditto | Jharia police-station | 1 mile | Ditto | Do. |
| 51 | Ghunyadi | Mr. A. M. Tuddeas | Ghunyadi | Ditto | Ditto | 1 „ | Ditto | Do. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc). |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.*<br>CHOTA NAGPUR DIVISION—*contd.*<br>*Manbhum District*—contd. | | | | | |
| 52 | Gopinathpur | Abhoya Charan Chatterjee. | Gopinathpur | Gobindpur Sub-division | Nirsha police-station | 4 miles | Palki | Coal. | |
| 53 | Ditto | Sidheswar Chatterjee | Ditto | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 54 | Ditto | Bhagaban Mohanto | Ditto | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 55 | Ditto | Gopal Chunder Mitra | Ditto | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 56 | Jogta | Agabeg Brothers | Jogta | Ditto | Dhanbad station | 5 „ | Ditto | Do. | |
| 57 | Kapasara | Dakhineswar Malia | Searsole, Raniganj | Ditto | Nirsha police-station | 3 „ | Ditto | Do. | |
| 58 | Ditto | Joyram Bhasta | Kapasara | Ditto | Ditto | 3 „ | Ditto | Do. | |
| 59 | Kubuka | Sambu Nath Dass | Nirsha | Ditto | Ditto | 1½ „ | Ditto | Do. | |
| 60 | Keslika | Raniganj Coal Association. | Kustor, Jharia | Ditto | Jharia police-station | 2½ „ | Ditto | Do. | |
| 61 | Kustor | Ditto | Ditto | Ditto | Ditto | 2 „ | Ditto | Do. | |
| 62 | Kujama | Gopal Kristo Roy | Murshidabad, Kasimbazar. | Ditto | Ditto | 1 mile | Ditto | Do. | |
| 63 | Korkend | Prosana Kumar Roy and others. | Korkend, Jharia | Ditto | Ditto | 3 miles | Ditto | Do. | |
| 64 | Koiludi | Katras, Jharia Coal Company. | Manager, F. S. Cook, Esq., Panchgori. | Ditto | Katras police-station | ½ mile | Ditto | Do. | |
| 65 | Koilasdi | Ditto | Ditto | Ditto | Ditto | ½ „ | Ditto | Do. | |
| 66 | Kumarjor | Ditto | Ditto | Ditto | Ditto | ½ „ | Ditto | Do. | |
| 67 | Lokorka | Lokorka Coal Company. | Lokorka, Barakar | Ditto | Ditto | ½ „ | Ditto | Do. | |
| 68 | Mailkura | Katras, Jharia Coal Company. | Manager, F. S. Cook, Esq., Panchgori. | Ditto | Ditto | ½ „ | Ditto | Do. | |
| 69 | Ditto | Ditto | Ditto | Ditto | Ditto | ½ „ | Ditto | Do. | |
| 70 | Nyadi | Gudadhur Roy | Kusumda, Jharia | Ditto | Jharia police-station. | 2 miles | Ditto | Do. | |
| 71 | Neslipattra | Ashutosh Pramanick | Neslipattra, Jharia | Ditto | Ditto | 1 mile | Ditto | Do. | |
| 72 | Patra Kuli | Haradhan Gorrain | Govindpur town | Ditto | Dhanbad station | 2 miles | Ditto | Do. | |
| 73 | Rajpura | Ayeb Musib | Rajpura Nirsha | Ditto | Barakar station | 5 „ | Ditto | Do. | |
| 74 | Subenga | Srimaito Dhan | Gobordanga, 24-Parganas. | Ditto | Dhanbad station | 4 „ | Ditto | Do. | |
| 75 | Salanpur | Katras, Jharia Coal Company. | Managar, F. S. Cook, Esq., Panchgori. | Ditto | Katras station | ½ mile | Ditto | Do. | |
| 76 | Sahandi | Dr. D. Bose | Sahandi | Ditto | Ditto | 1½ miles | Ditto | Do. | |

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| 77 | Sanjilataur | Mr. C. Smith | Bhakatdi, Jharia | Ditto | Ditto | 1 mile | Ditto | Do. |
| 78 | Ditto | Behary Trigunait | Malikora, Katras | Ditto | Ditto | 1 „ | Ditto | Do. |
| 79 | Sijna | Messrs. Finlay, Muir & Co. | Sijna, Raniganj | Ditto | Dhanbad station | 5 miles | Ditto | Do. |
| 80 | Tentulia | Tentulia Coal Company. | Tentulia | Ditto | Katras station | 1 mile | Ditto | Do. |
| 81 | Topataur | E. I. Coal Company | Topataur | Ditto | Nirsha police-station | 3 miles | Ditto | Do. |
| 82 | Agarpattra | Trigunait Bros. | Manager, Trigunait Bros., Agarpattra mine, Malihara. | Ditto | Katras station, Jharia Extension. | ½ mile | Ditto | Do. |
| 83 | Bhaba | Ram Nath Das | Nirsha | Ditto | Nirsha police-station | 1 „ | Ditto | Do. |
| 84 | Egarkur | Kanji Muji Kachi | Egarkur | Ditto | Barakar station | 3 miles | Ditto | Do. |
| 85 | Kenduardi | E. I. Coal Company | Assansol, Burdwan | Ditto | Dhanbad station | 4 „ | Ditto | Do. |
| 86 | Bharmuri | Anand Chakrabarti | Mira, Pergana Pandra | Ditto | Barakar station | 1 mile | Ditto | Ghooting. |
| 87 | Chirkunda | Lambodar Laik | Naikdi | Ditto | Ditto | 1 „ | Ditto | Do. |
| 88 | Ichagor | Ramdas Babu | Ichagor | Sardar Sub-division | Chandil | 14 miles | Bullock cart | Stone. |
| 89 | Chandil | Nilmoni Khan | Chandil | Ditto | Ditto | 8 „ | Ditto | Do. |
| 90 | Ditto | Biswanath and Kedar Nath Pal. | Ditto | Ditto | Ditto | 12 „ | Ditto | Do. |
| 91 | Kamartaur mine | Nando Gorain | Chirkunda, police-station Nirsha. | Kamartaur, Gobindpur Sub-division. | Jharia police-station | 6 and 5 miles | Palki or cart | Coal. |
| 92 | Gopali chak mine | Madhatya Kachhi | Gopali chak, police-station Jharia. | Gopali chak, Gobindpur Sub-division. | Barakar station | 1 mile | Ditto | Do. |
| 93 | Ladna mine | Laik Coal Company | Begunia, near Barakar | Ladna, Gobindpur Sub-division. | Jharia police-station | 1 „ | Ditto | Do. |
| 94 | Madhuban mine | Ditto | Ditto | Madhuban, Gobindpur Sub-division. | Ditto | 2 miles | Ditto | Do. |
| 95 | Golakdi mine | Cohen and Company | Golakdi, police-station Jharia. | Golakdi, Gobindpur Sub-division. | Ditto | 2 „ | Bullock cart and palki. | Do. |
| 96 | Kusunda | Bengal-Nagpur Coal Company. | Bhakatdi, police-station Jharia. | Kusunda, Gobindpur Sub-division. | Ditto | 2 „ | Ditto | Do. |
| 97 | Shampur mine | Bengal Stone Company | No. 100, Clive Street, Calcutta, and Shampur, Nirsha. | Shampur, Gobindpur Sub-division. | Nirsha police-station | 2 „ | Bullock cart | Do. |
| 98 | Ditto | Lakhan Chandra Mitra | Shampur, police-station Nirsha. | Ditto | Ditto | 2 „ | Ditto | Do. |
| 99 | Nirsha mine | Ditto | Ditto | Ditto | Police-station Nirsha | 1 mile | Ditto | Do. |
| 100 | Egarkur mine | Akhil Chander Pal | Ramnagar, Assansol, district Burdwan. | Egarkur | Barakar | 3 miles | Ditto | Do. |
| 101 | Ditto | Amaljuna Kachhi | Egarpur, police-station Nirsha. | Ditto | Ditto | 3 „ | Ditto | Do. |
| 102 | Ditto | Sagen Lal Nagar Kachhi | Ditto | Ditto | Ditto | 3 „ | Ditto | Do. |
| 103 | Kalimati mine | Banwari Lal Rai | Ludna, Barakar | Kalimati, Gobindpur Sub-division. | Ditto | 3 „ | Ditto and palki | Do. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE—*contd.* | | | | | |
| | | | | CHOTA NAGPUR DIVISION—*contd.* | | | | | |
| | | | | *Manbhum District*—concld. | | | | | |
| 104 | Gold mine | Messrs. Barry & Co. | Bandih | Bandih, Chandil thana, Sadar Sub-division. | Chandil, B.N. R. | 14 miles | Bullock cart and palki. | Gold. | |
| 105 | Limestone mine | Karali P. Mukherjee | Kutchbell | Packet Hill, Raghunathpur. | Ramkanali | 5 „ | Ditto | Limestone. | |
| 106 | Stone mine (lime) | Mr. Deveria | Purulia | Hansapathur, Raghunathpur. | Ditto | 8 „ | Ditto | Lime. | |
| 107 | Bharmuri mine | Burn & Co. | Raniganj, district Burdwan. | Bharmuri, Gobindpur Sub-division. | Barakar | 1 mile | Ditto | Stone and kharimati. | |
| 108 | Jarpahari mine | Bengal Stone Company | No. 100, Clive Street, Calcutta; Shampur, Nirsha. | Bandar Chuya, Gobindpur Sub-division. | Nirsha police-station | 2 miles | Ditto | Coal. | |
| 109 | Dulmi stone mine | Madhab Poddar | Dulmi, Barakar | Dulmi, Chandil thana, Sadar Sub-division. | Nimdi, B. N. R. | 6 „ | Bullock cart | Stone, plates and slabs. | |
| 110 | Bondihi stone mine | Udhab Mandal | Bondihi | Bondihi, Chandil thana, Sadar Sub-division. | Chandil, B. N. R. | 8 „ | Ditto | Stone, plates and slabs. | |
| 111 | Ditto | Kishore Dutta | Ditto | Ditto | Ditto | 10 „ | Ditto | Do. | |
| 112 | Shampur mine | Bengal Stone Company | No. 100, Clive Street, Calcutta; Shampur, Nirsha. | Shampur, Gobindpur Sub-division. | Nirsha police-station | 2 „ | Ditto | Coal. | |
| 113 | Kapasara mine | Kanai Lal Dey | Calcutta and Chirkunda. | Kapasara, outpost Chirkunda, Gobindpur Sub-division. | Barakar | 1 mile | Ditto and palki | Ghutting mine. | |
| 114 | Ditto | Ramesh Roy | Chirkunda | Ditto | Ditto | 1 „ | Ditto | Do. | |

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|---|---|---|---|---|---|---|---|---|
| 115 | Ditto | Bhutnath Roy | Ditto | Ditto | Ditto | 1 „ | Ditto | Do, |
| 116 | Ditto | Brajo Roy | Ditto | Ditto | Ditto | 1 „ | Ditto | Do. |
| | | | | **Bhagalpur Division.** | | | | |
| | | | | *Sonthal Parganas District.* | | | | |
| 1 | Domanpur coal mine | Keshub Chandra Dey | Rassickpur, post office Dumka, District Sonthal Parganas. | Sub-division Doomka | Rampurhat | 28 or 29 miles | Hackney, palanquin, or cart. | Coal. |
| 2 | Ghatchora coal mine | | | | | | | |
| 3 | Sultanpur | Benwari Lal Kahiraj, and Ram Lal Kahiraj. | Sultangur, Taluk Kendua Kansta, Pargana Kundohit, Sub-division Jamtara. | Sub-division Jamtara | Churulia | 3 miles | Bullock cart | Do. |
| | | | | *Monghyr District.* | | | | |
| 1 | Pananwan | New Indian Mica Company. | 6, Clive Row, Calcutta | Sub-division Jamui | Nawadih | 4½ miles | Bullock-hackney | Mica. |
| 2 | Charka Pathal in Mahesri. | F. F. Chrestien & Co. | Tisri Bhurai post office, Giridih. | Prospecting in Gadi Mahesri, Sub-division Jamui. | Ditto | 12 miles | Horse or dooly | Do. |
| 3 | Beyhayet | C. W. F. Buckland, Esq., and Mr. E. M. Floyed. | Nawadih post office | Sub-division Jamui | Ditto | 12 „ | Palki or riding | Do. |
| 4 | Dahian | Babu Lal Singh of Khandeyech. | Khandayech, Sub-division Jamui. | Ditto | Ditto | 10 „ | Dooly or horse | Do. |
| 5 | Kharuckpur hills slate and stone quarries. | Ambler & Co., lessee, from Raj Darbhanga. | Ambler & Co., lessee, slate works, Bussownee *viâ* Dharhara. | Pargana Khuruckpur | Dharhara station, East Indian Railway, loop line. | 8 miles from railway station. | Dooly or country cart. | Slates for roofing and flooring, and mill stones. |
| 6 | Karee Khan Havalle, Khuruckpur, near Rishikund. | Ditto | Ditto | Ditto | Monghyr | 9 miles | Ditto | Slates only. |
| | | | | **Patna Division.** | | | | |
| | | | | *Gaya District.* | | | | |
| 1 | Sapahi mica mine | Babu Dirgopal Lal | Manager, Sapahi mica mine *viâ* Rajowli post office, Gaya. | Sub-division Nawada | Rajowli police-station | 14 miles | Palki or riding | Mica. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| | | | BENGAL PROVINCE—*concld.* | | | | | | |
| | | | PATNA DIVISION—*contd.* | | | | | | |
| | | | *Gaya District*—contd. | | | | | | |
| 2 | Singar mica mine | Owner, Babu Jaimangal Prasad Narain Sing, of Singar; Lessee, Messrs. Chrestien & Co. | Messrs. Chrestien & Co., Singar, Rajowli post office, Gaya. | Sub-division Nawada | Rajowli police-station | 6 miles | Palki or riding | Mica. | |
| 3 | Chatkari | Owner, Government; Lessee, Babu Radha Binod Majundar. | Manager, Chatkari mines, *vid* Rajowli post office (Gya). | Ditto | Ditto | 11 „ | Ditto | Do. | |
| | | | CENTRAL PROVINCES. | | | | | | |
| | | | NAGPUR DIVISION. | | | | | | |
| | | | *Chanda District.* | | | | | | |
| 1 | Warora Colliery | Government of India | Manager, Warora Colliery, Warora, C. P. | Warora Sub-division | Warora station, Wardha Coal State Railway. | 2 miles | Road, or railway by trolly. | Coal and fire clay. | |
| | | | NERBUDDA DIVISION. | | | | | | |
| | | | *Narsingpur District.* | | | | | | |
| 1 | Mohpani Colliery | Nerbudda Coal and Iron Company, Limited. | Agent and Manager, Mohpani, *vid* Gadarwara Station, Great Indian Peninsula Railway. | Gadarwara Sub-division | Gadarwara station, Great Indian Peninsula Railway. | 12 miles | Railway. Probably by trolly or coal train. | Coal. | |

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| | | | | REWAH STATE. | | | | | |
| 1 | Umaria Colliery | Land owned by Rewah State. Machinery, etc., owned, and mines worked by Government. | Manager, Central Provinces Collieries, Umaria. | In Rewah State | Umaria station, Bengal-Nagpur Railway. | Nearly 2 miles to pit head. | Railway by trolly. | Coal. | |
| | | | | PUNJAB PROVINCE. | | | | | |
| | | | | RAWALPINDI DIVISION. | | | | | |
| | | | | *Jhelum District.* | | | | | |
| 1 | Dandot coal mine | Government | Manager, Dandot Colliery, *vid* Khewra, Sind-Saugor branch of the North Western Railway, Punjab. | Near Dandot village, Tahsil Pind Dadan Khan. | Khewra railway station. | 4 miles | By means of coal train tramway. | Coal. | |
| 2 | Pidh Colliery | Ditto | Ditto | Near village Pidh, Tahsil Pind Dadan Khan. | Ditto | 6 „ | By road or tramway from Dandot mine. | Do. | |
| 3 | Baghanwalla Colliery. | Ditto | Ditto | Near village Baghanwalla, Tahsil Pind Dadan Khan. | Haranpur railway station. | 12 „ | Ditto | Do. | |
| 4 | Khewra salt mine | Ditto | Superintendent, Khewra Salt Mine, Khewra, Sind-Saugor branch of the North Western Railway, Punjab. | Near Khewra village, Tahsil Pind Dadan Khan. | Khewrah railway station. | 1 mile | By road | Salt. | |
| | | | | DERAJAT DIVISION. | | | | | |
| | | | | *Bannu District.* | | | | | |
| 1 | Kalabagh salt mine | Government | Superintendent, Kalabagh salt quarries, Kalabagh, *vid* Mari on the Mari branch of the Sind-Saugor extension of the North Western Railway. | Mouza Kalabagh, Tahsil Isakhel, Sub-division Mianwali. Near Mari on the river Indus, Shahpur District, Punjab. | Mari railway station, S. S. Branch, North Western Railway. | 3 to 4 miles | Boat across the river; and on foot, or horse. | Salt. | Only a few small irregular quarries are being worked. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
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| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | PUNJAB PROVINCES—*contd.* | | | | | |
| | | | | DERAJAT DIVISIONS—*concld.* | | | | | |
| | | | | *Bannu District*—concld. | | | | | |
| 2 | Nagpur . . . | Government . . | Superintendent, Nurpur Salt Mine, *vid* Lilleh, Sind-Saugor branch of the North Western Railway, Punjab. | Nurpur, near to Lilleh, Jhelum District, Punjab. | Lilleh . . . | 15 miles . . | By riding in carriage, or on camel, or mule. | Salt . . . | There is a rest-house at Kandwal which is about 9 miles from Lilleh and 6 from the mine. The Superintendent of the Mine, or the Deputy Inspector of Police, usually arranges for conveyances. The mine is a very small one. |
| 3 | Warcha . . | Ditto . . . | Superintendent, Warcha Salt Mine, *vid* Gunjial, Sind-Saugor branch of the North Western Railway, Punjab. | Warcha, near to Gunjial, Shahpur District, Punjab. | Gunjial*. . . | 9 ,, . . | Riding on trolly or ballast train or on an animal. | Do. . . . | The mine Superintendent or the railway officials might help to arrange convenience for riding if asked in time. There is a railway bungalow at Gunjial. |

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| 4 | Kohat quarries | Ditto | Superintendent, Kohat Salt Mine, Kohat, *viâ* Khushalgarh, on the Rawal Pindi and Khusalgarh branch of the North Western Railway. | Kohat-Peshawar District, Punjab. | Khushalgarh | 29 „ | By tonga | Do. | Only the quarries are being worked since the mines were closed. |
| 5 | Mandi | Raja of Mandi | Superintendent, Mandi Salt Mine, Drang, *viâ* Pathankot on the Amritsar and Pathankot branch of the North-Western Railway. | Guma, and Drang, Mandi District, Punjab. | Pathankot | 119 „ | Tonga, ekha and pony *viâ* Kangra, Palampur, Guma, etc. | Salt | Mines and quarries. |
| 6 | Kalabagh Alum shale mine. | Malik of Kalabagh | Malik of Kalabagh, Kalabagh *viâ* Mari, on the Mari branch of the Sind-Saugor Extension of the North Western Railway. | Kalabagh, near to Mari on the river Indus, Shahpur District, Punjab. | Mari | 3 „ | Boat and riding or walking. | Alum shale | These are small mines. Alum is made from the shale in Kalabagh town. |
| | | | | BALUCHISTAN. | | | | | |
| 1 | Sor Range Coal mines. | Messrs. Sorabji & Co., Quetta. | Messrs. Sorabji & Co., General Merchants, etc., Quetta, Baluchistan. | In the Sor Range of hills, near Quetta, Baluchistan. | Quetta | About 30 miles | By camels | Coal | No returns have been received from this mine. |
| 2 | Ditto | Sirdar Bawal Khan, Dust. | Sirdar Bawal Khan, Dust, near Bolan, Quetta, Baluchistan. | Ditto | Ditto | „ 30 „ | Ditto | Do. | Ditto. |
| 3 | Ditto | Khan Bahadur B. D. Patel, Quetta. | Khan Bahadur B. D. Patel, Quetta, Baluchistan. | Ditto | Ditto | 20 to 24 „ | Ditto | Do. | Ditto |
| 4 | Ditto | Pestonji Hormusji Guddially, Quetta. | Pestonji Hormusji Guddially, Lansdowne Hotel, Quetta, Baluchistan. | Ditto | Ditto | About 20 „ | Ditto | Do. | Ditto |
| 5 | Ditto | Peroz Shaw Ruttonji, Sogoo, Quetta. | Peroz Shaw Ruttonji Sogoo, Merchant, Quetta, Baluchistan. | Ditto | Ditto | „ 20 „ | Ditto | Do. | Ditto. |
| 6 | Shahrig | Government (North-Western Railway). | Mine Manager, Shahrig, Baluchistan. | Shahrig Tahsil, Thal Chotiali District, Baluchistan. | Shahrig | 3 to 4 miles | Walking or riding | Do. | This mine was closed owing to an outbreak of cholera. |
| 7 | Khost | Ditto | Ditto | Ditto | Khost | 1 to 2 „ | Ditto | Do. | |

| No | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
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| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | **PUNJAB PROVINCE—*concld.*** | | | | | |
| | | | | **JULLUNDER DIVISION.** | | | | | |
| | | | | ***Kangra District.*** | | | | | |
| 1 | Kohr Iron Mine . | Government . . . | Kohr *viâ* Baijnath . | Kothr Kohr . . . | Pathankote, North-Western Railway. | 121 miles . . | Mules, ponies and bullocks. | Iron . . . | The lease is sold by public auction annually, and fetches about ₹50. |
| | | | | **BOMBAY PRESIDENCY.** | | | | | |
| | | | | **(A)—BRITISH DISTRICTS.** | | | | | |
| | | | | ***Shikarpur.*** | | | | | |
| 1 | Sukkar Quarries, Nos. 1 to 24. | Nos. 12, 13 and 17 to 22 belong to Sukkar Municipality. Nos. 1 to 10 and 23 to N. W. P. Railway, and the rest to Military Works Department. | See information in column 2. | Taluka Sukkar . . | Nos. 1 to 22 and 24 Sukkar main, No. 23 Sukkar bunder. | Within a mile . | Carts . . . | Limestone. | These mines were not included in any of the returns for 1895. |
| 2 | Rohri and Arore Quarries. | Rohri Municipality and Government. | Ditto . . . | Taluka Rohri . . | Rohri . . . | Rohri 1 mile, Arore 5 miles. | Camel, carts and horses, etc. | Limestones, sandstones and other kinds of sand. | |
| | | | | ***Ahmednagar.*** | | | | | |
| 1 | Quarry . . . | Government . . . | ..... | Jamkhed, Karjat, Srigonda, Nagar and Parnet. | ..... | ..... | Bullock cart . | Limestone and stone metal. | |

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| | | | | *Poona.* | | | | | |
| 1 | Sansar | Forest Department | Forest Department | Indapur Taluka | Diksal | ..... | Bullock cart | Stone metal | |
| 2 | Ghode | Ditto | Ditto | Ambegaon Petha | ..... | ..... | Ditto | Do. | |
| 3 | Wadad Khurd | Ditto | Ditto | Taluka Sirur | Talegaon | 5 miles | Ditto | Do. | |
| 4 | Khadki | P. W. Department | P. W. Department | Taluka Bhimthadi | Bori | 8 „ | Ditto | Do. | |
| 5 | Padir | P. W. Department | P. W. Department | Taluka Bhimthadi | Kedgaon | 8 „ | Ditto | Do. | |
| 6 | Walki | Nanaji constructor | ..... | Petha Dhond | Dhond | 3 „ | Ditto | Do. | |
| 7 | Dhond | Nathuram | ..... | Ditto | Ditto | 3 „ | Ditto | Do. | |
| 8 | Delavdi | Kesukushaba | ..... | Ditto | Ditto | 3 „ | Ditto | Do. | |
| 9 | Phursangi | Amrita and others | ..... | Taluka Haveli | Phursangi | 1½ „ | Ditto | Do. | |
| | | | | *Hyderabad.* | | | | | |
| 1 | Fuller's Earth mine | Government | Government | T. Hyderabad, Hala Sub-division. | Hyderabad | 6 miles | By road | Fuller's earth. | |
| | | | | *Panch Mahals.* | | | | | |
| 1 | Quarry | Government | ..... | Bajarwada in Jhalod Petha. | Limkheda on Godhra-Ratlam line. | 23 miles | Bullock cart | Dark-bluish coloured soft stone slates. | It is used for building purposes. Annually leased. This mine was not included in the returns for 1895. |
| | | | | *Dharwar District.* | | | | | |
| 1 | Gold mine | Alnawar Gold Mining Company. | Alnawar, Dharwar District. | Dharwar District | Alnawar railway station. | ⅛ mile | Good road | Auriferous stones. | |
| | | | | (B).—Native States. | | | | | |
| | | | | *Cutch.* | | | | | |
| 1 | Bhuj Quarries, 11 in number. | Cutch State | Cutch State | Bhuj | ..... | ..... | Carts or donkeys | Black stones, red stones, limestones, sandstones and hard flat laminated stones. | These mines were not included in the returns for 1895. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks, (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | **BOMBAY PRESIDENCY—*contd.*** | | | | | |
| | | | | **(B).—Native States—*contd.*** | | | | | |
| | | | | ***Cutch*—contd.** | | | | | |
| 2 | Mandvi Quarries, 6 in number. | Cutch State | Cutch State | Nabhai, Mandvi, Goniarsar and Bhadai. | ..... | ..... | Carts or donkeys | White stone. | These mines were not included in the returns for 1895. |
| 3 | Andhakni Quarry | Ditto | Ditto | Khávda | ..... | ..... | Carts | Do. | |
| 4 | Baryani | Ditto | Ditto | Mundra | ..... | ..... | Ditto | Do. | |
| 5 | Bhadresarni | Ditto | Ditto | Ditto | ..... | ..... | Ditto | Do. | |
| 6 | Navinal | Ditto | Ditto | Ditto | ..... | ..... | Ditto | Do. | |
| 7 | Mathak | Ditto | Ditto | Anjore | ..... | ..... | Ditto | Do. | |
| 8 | Parjan | Ditto | Ditto | Abdusha | ..... | ..... | Ditto | Reddish stone. | |
| 9 | Jukhan | Ditto | Ditto | Jukhan | ..... | ..... | Ditto | White stone. | |
| | | | | ***Kathiawar.*** | | | | | |
| 1 | Three Dhars, Lakhtar Quarries, 5 in number. | Lakhtar State | Lakhtar State | Thán Sim in Lakhtar State. | Thána railway station, Muli Railway. | 1 mile | Bullock carts | Building stones, and crude coals. | |
| 2 | Wadwhan Quarries, 9 in number. | Wadwhan State | Wadwhan State | Wadwhan | Wadwhan and Wadwhan Junction. | 5 miles | Ditto | White and red stones. | This mine was not included in the returns for 1895. |
| 3 | Saila Quarry | Saila State | Saila | Saila | Than and Dholia | 4 and 8 miles respectively. | Ditto | Sandstone and clay. | |
| 4 | Muli | Muli State | Muli State | Muli | Muli Station | 3 miles | Ditto | Red sandstone. | |
| 5 | Datha | Shareholders of Datha and Jali and Bambhor. | Datha State | Datha | Bhawnagar | 50 „ | Ditto | White gray stones. | |
| 6 | Chámardi | Chámardi Talukdars | Chámardi Talukdars | Chámardi | Sihor and Songad | 10 „ | Ditto | Do. | |
| 7 | Dhángadhra, 43 Quarries. | Dhangadhra State | Dhángadhra | Jhalévád Sub-division | Wadhwan, Khara, Godha, Lakhtar and Morvi. | Within 50, 23, 20 and 28 miles. | Ditto | Grinding and building stones. | |

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| | | | | *Palanpur State.* | | | | | |
| 1 | Palanpur State Quarries, 5 in number. | Palanpur State . . | The Dewansahib of Palanpur. | Palanpur State . . | Sarotri on R. M. Railway. | Within 18 miles . | Carts . . . | Granite stones . | This mine was not included in the returns for 1895. |
| 2 | Wáo State, 2 Quarries. | Sami (Saint) and Rana of Wáo. | Dodgaum Head Sami and Rana of Wao. | Dadgaum under Wáo . | Deesa railway station. | „ 38 „ . | Camel, and country carts. | Clay and chunam. | |
| 3 | Santhalpore, 4 Quarries. | Jodeji Sámer Kanji, Thakore Rawji, and others. | Santhalpore . . . | Santhalpore . . . | Patdi and Pattun . | „ 60 „ . | Bullock carts . | White and red clay, and building stones. | This mine was not included in the returns for 1895. |
| | | | | *Mahikantha.* | | | | | |
| 1 | Idar, 7 Quarries . | The Máharaja of Idar . | The Máharaja of Idar . | Ahmednagar and Vadali | Vadnagar . . | Within 48 miles . | Country carts . | Sand and limestones. | These mines were not included in the returns for 1895. |
| 2 | Salvekántha . . | Thakore of Khedawáda . | Thakore of Khedawáda . | Khedawáda . . . | Ditto . . | 24 miles . . | Carts, and camels | Sandstones . . | |
| 3 | Ilol . . . | The Thakore of Ilol . | The Thakore of Ilol . | Ilol . . . . | Ditto . . | 20 „ . . | Carts . . . | Do. . . | |
| | | | | *Rewakantha.* | | | | | |
| | | | | *Gujarat State.* | | | | | |
| 1 | Rajpipla Quarries, 4 in number. | Rajpipla State and Durbar. | Rajpipla State . . | Ratanpur Taluk Jaghadia in Rajpipla State. | Ankleshwar on B., B. and C. I. Railway. | 15 miles . . | Bullock carts . | Akik (carnelian) stones. | These two mines were not included in the returns for 1895. |
| 2 | Wadasinor . . | Nabob of Wadasinor . | Nabob of Wadasinor . | Dongrali in Wadasinor . | Sewalia . . . | 10 „ . . | Ditto . . | Building stones . | |
| 3 | Sunth . . . | Sunth Darbar . . | Sunth . . . . | Valai river in Sunth . | Sunth road . . | 37 „ . . | Ditto . . | Do., ordinary . | |

The carnelian stones in the rough state are removed to Limodra village; they are for some time left in the heat of the sun, and are afterwards burnt in kiln. Then they are selected by Cambay merchants, and taken to Bombay, where they are manufactured into buttons, toys, etc., known as "Cambay agate."

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of Mine—State, Province, Division, Sub-division or District. | Nearest or most convenient Railway or other Station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | **MADRAS PRESIDENCY.** | | | | | |
| | | | | *Godavari District.* | | | | | |
| 1 | Rajahgompalli coal mines. | The Godavari Coal Company, Limited. | Rajahgompalli *vid* Wudagudiem, Godavari District. | Bhadrachalam Taluk | Rajahmundry, East Coast Railway. | 80 miles | Boat up the river Godavari. | Coal | The Company is only working under prospecting licenses, a mining lease not having yet been granted. |
| | | | | *Nellore District.* | | | | | |
| 1 | Pokkandala | Messrs. Kodah Badusha and Hadi Badusha Company, Madras. | Golam Dastagir Sahib, Manager of the Company, residing in Korchi Konda in Gokula Brindavanam Shrotriem, *vid* Sythapuram Post. | Pokkandala Shrotriem | Gudur railway station, South Indian Railway. | 10 miles | Road up to Sythapuram for seven miles and thence cart-track for three miles. | Mica. | |
| 2 | Chaganam | Ditto | Ditto | Chaganam No. 1 unoccupied waste. | Ditto | 10 „ | Road up to Chaganam for 12 miles and thence by cart-track for two miles. | Do. | Only prospecting. |
| 3 | Turupu Bundla | Ditto | Ditto | Turupu Bundla Forest Reserve No. 1. | Ditto | 6 „ | Road up to Tippavarapad for five miles and thence by cart-track for two miles. | Do. | Ditto. |
| 4 | Utukur | K. Munisami Iyer of Madras. | K. Munisami Iyer, owner of mica mine in Utukur, *vid* Sythapuram Post. | Utukur Survey No. 137 | Ditto | 13 „ | Road up to Sythapuram for seven miles and bandy-track for six miles. | Do. | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Three Mica Mines | Palukur Venkatranie Reddy. | Nellore Taluk | Thatiparti, Atmakur Taluk, Nellore District. | Atmakur | 11 miles | | Road | Mica |
| 6 | Mica Mine | K. Munuswamy Iyer | Madras | Mangalapur, Gudur Taluk. | Gudur Railway Station. | 6 „ | Douka | Do. |
| 7 | Ditto | Ditto | Ditto | Chennore, Gudur Taluk. | Ditto | 4 „ | Road | Do. |
| 8 | Ditto | B. Venkatasubba Reddy | Varagali, Gudur Taluk. | Ditto | Ditto | 4 „ | Do. | Do. |
| 9 | Podlakur Inukurti Mine. | K. Venkiah | Nellore | Podlakur, Rapur Taluk | Nellore Railway Station. | 21 „ | Road up to Inukurti and cart track to the mine. | Do. |
| 10 | Biradavole Mine | Messrs. Best & Co. | Madras | Biradavole | Ditto | 15 „ | Road to Biradavole and cart track to the mine. | Do. |
| 11 | Orupally Mine | Epur Narayana Reddy | Epur, Gudur Taluk | Orupally Shrotriem | Manubole Railway Station. | 15 „ | Road to Veerampalli and cart track to the mine. | Do. |
| 12 | Chatagotla Mine | P. Venkata Reddy | Boddureanpollem, Nellore Taluk. | Chatagotla Shrotriem | Nellore Railway Station. | 15 „ | Road to Chatagotla and cart track to the mine. | Do. |
| 13 | Mudigeru Mine | K. Subbarami Reddy | Kondapudy, Taluk. Nellore | Mudigeru | Ditto | 21 „ | Road to Inukurti and cart track to the mine. | Do. |
| 14 | Toderu Mine | P. Adini Reddy and Rama Ragana Reddy. | Toderu | Toderu | Ditto | 13 „ | Road to Toderu and cart track to the mine. | Do. |
| 15 | Rachukkala Mine | Ibrahim Saheb & Co. | Gudur | Chaganam | Gudur Railway Station. | 11 „ | Road to Chaganam and cart track to the mine. | Do. |
| 16 | Pallamitea Mine | Messrs. Haji Md. Badsha Saheb & Co. | Madras | Malakalapondia | Ditto | 7½ „ | Road to Sydapuram and cart track to the mine. | Do. |
| 17 | Sha Mine | Ditto | Ditto | Sydapuram | Ditto | 9 „ | Ditto | Do. |
| 18 | Tella Bodu Mine | Ansoor Subba Naidu | Indukarpet, Taluk. Nellore | Ditto | Ditto | 9 „ | Ditto | Do. |
| 19 | Rachukkala Bodu Mine. | B. Venkata Subba Reddy | Varagali, Gudur Taluk | Chaganam | Ditto | 10 „ | Road to Chaganam and cart track to the mine. | Do. |
| 20 | Poturaju Mine | Ditto | Ditto | Turimerla | Ditto | 15 „ | Road to Sydapuram and cart track to the mine. | Do. |
| 21 | Vandur Kalana Mine. | Ditto | Ditto | Vutukur | Ditto | 12 „ | Ditto | Do. |

The Imperial mining rules are now being followed in dealing with applications for prospecting and mining for mica—*vide* G. O. 618 R. D., dated 30th November 1896.

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of Mine—State, Province, Division, Sub-division or District. | Nearest or most convenient Railway or other Station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | MADRAS PRESIDENCY—*contd.* | | | | | |
| | | | | *Nellore District.* | | | | | |
| 22 | C. Mine | Ansoor Subba Nayudu | Indukurpet | Perumallapod | Gudur Railway station. | 12 miles | Road to Sydapuram and cart track to the mine | Mica | The Imperial mining rules are now being followed in dealing with applications for prospecting and mining for mica—*vide* G. O. 618, R. D., dated 30th November 1896. |
| 23 | Nandala Gunta Mine | Ditto | Ditto | Toorpupoondla | Ditto | 6 „ | Ditto | Do. | |
| 24 | Dundigam Mine | Lakka Konda Reddy | Tadeparte, Atmakur Taluq. | Dundigam, Kavali Taluk | Nellore Railway station. | 25 „ | Road | Do. | |
| 25 | Ditto | L. Annapa Nayudu | Tarunavoya, Nellore Taluk. | Ditto | Ditto | 25 „ | Do. | Do. | |
| 26 | Ditto | Sheik Khaja Sahib | Talupurpodu, Atmakur Taluk. | Ditto | Ditto | 25 „ | Do. | Do. | |
| 27 | Ditto | S. Venkatappa | Srikolam, Atusakar Taluq. | Ditto | Ditto | 25 „ | Do. | Do. | |
| 28 | Ditto | Kotukonda Chinamala Kondadu. | Dundigam | Ditto | Ditto | 25 „ | Do. | Do. | |
| 29 | Gudladona Mine | M. S. Abdul Waheb Saheb & Co. | Madras | Gudladona | Ditto | 30 „ | Do. | Do. | |
| 30 | Laxmipuram Guru Jumany Chimmgani Yessa Chinnagani. | B. Ranga Reddy | Kavur, Nellore Taluk | Laxmipuram | Ditto | 32 „ | Do. | Do. | |
| 31 | Chinakraka Mine | Udayagiri Company | Udayagiri | Chinakraka | Ditto | 35 „ | Do. | Do. | |
| 32 | Tellapodu Mine | Anchoor Subba Nayudu | Indukurpet, Nellore Taluk. | Tellapodu | Ditto | 49 „ | Do. | Do. | |
| 33 | Kakatur Mine | 1. G. Venkata Subba Reddy. 2. K. Yendi Reddy | Ditto | Kakutur Shotriem | Ditto | 48 „ | Do. | Do. | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 8 | Phosphatic Nodule Mine, Perambalur Taluk, Trichinopoly District. | Messrs. Arbuthnot & Co., Madras, Lessees. | Messrs. Arbuthnot & Co., Madras and Lessees of Phosphatic Nodule Mines, Uttathur and villages, Perambalur Taluk. | Perambalur Taluk, Trichinopoly District. | Trichinopoly on the South India Railway. | 23 „ | Road for 21 miles up to Pudalur and thence cart track for 2 miles up to Uttathur. | Phosphatic nodules. | The grant of a mining lease for 30 years has been sanctioned in G. O. 379, dated 30th July 1896. |
| | | | | *North Arcot District.* | | | | | |
| 1 | The Mysore Reefs Gold Mines. | The Mysore Reefs Gold Mining Company, Limited. | John Garland, Esq., Secretary, Mysore Reefs Gold Mining Company, No. 6, Queen's Street Place, London. | Arthinathan, Kangundi-Zemindari, Vellore Subdivision. | Disanotham Station, Bangalore Branch, Madras Railway, south-west line. | About 1½ miles | Bisanathum is only a trial station. There are no villages within a radius of one mile. Bandies or any other kind of conveyances are not available at the station. If previous arrangements are made for country carts, they may be had at times. | Gold quartz | The best way is to go *vid* the Kolar Gold Mines. —J. G. |
| | | | | *Anantapur District.* | | | | | |
| 1 | Diamond Mine | Mr. Wilkins, Agent, Diamond Company, Wazrakarur. | Diamond Company at Wazrakarur. | Wazrakarur, Gooty Taluk. | Six miles from Gulapaliem Railway Station, Southern Mahratta Railway, or 10 miles from Guntakal junction. | Six miles from Gulapaliem, or ten miles south of Guntakal. | Common country carts on hire. | Diamond. | |
| | | | | *Visagapatam District.* | | | | | |
| 1 | Kodur Manganese Mines. | The Maharajah of Vizianagram and others. | Henry J. Emison, Manager, Kodur Mines. | Kodur near Cheepurupalli. | Garividi Station, East Coast Railway. | About one mile | Carts | Manganese. | |
| | | | | HYDERABAD (Deccan). | | | | | |
| 1 | Singareni Colliery | The Hyderabad (Deccan) Co., Ld. | Thomas Wilkinson, Esq., Manager at the mine. Agent and General Manager in India, T. H. Lowinsky, Esq., Secunderabad; London Office, No. 19, St. Helen's Place, London. | Yellandu, 157 miles from Secunderabad. | Yellandu, the terminus of a 16-mile branch Railway from Dornakal Junction. | ½ to 2 miles | Walking and on trolly. | Coal. | |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of Mine—State, Province, Division, Sub-division or District. | Nearest or most convenient Railway or other Station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | MYSORE STATE. | | | | | |
| | | | | *Mysore District.* | | | | | |
| 1 | Woolagiri Mysore Gold Mine. | Woolagiri Mysore Gold Mining Company, Limited. | Valgere, Nanjangud Taluk. | Nanjangud Taluk . | ..... | ..... | ..... | Gold. | |
| | | | | *Kolar District.* | | | | | |
| 2 | Mysore Reefs Gold Mine. | Mysore Reefs Gold Mining Company, Limited. | Valley Property, Oorgaum. | Marikuppam, Bowringpet Taluk, close to Mysore State boundary. | Bisanattam, Madras Railway, Mysore terminus of Kolar Gold Field branch. | 1½ miles . . | On horse, or walking. | Gold. | |
| 3 | South-East Mysore Gold Mine. | South-East Mysore Gold Mining Company, Limited. | Yerrakonda block, Oorgaum. | Marikuppam, Bowringpet Taluk, close to Yerrakonda hill. | Ditto . . | 3½ „ . . | Ditto . . | Do. | |
| 4 | Yerrakonda Gold Mine. | Yerrakonda Gold Mining Company, Limited. | Ditto . . | Ditto . . | Ditto of the Mysore Mines Station. | 3½ „ . . | Ditto . . | Do. | |
| 5 | Mysore Gold Mine . | Mysore Gold Mining Company, Limited. | Oorgaum, Bowringpet Taluk, also 6, Queen Street Place, London, E.C. | Marikuppam, Bowringpet Taluk, Kolar Gold Fields. | Mysore Mines Station. | The station is the terminus station of the Kolar Gold Field Railway and is on the mine | Walking . . | Do. | |
| 6 | Champion Reef Mine. | Champion Reef Gold Mining Company of India, Limited. | Ditto . . | Oorgaum, Bowringpet Taluk, Kolar Gold Fields. | Champion Reefs . | Close to, and on the Kolar Gold Field Railway. | Ditto . . | Do. | |
| 7 | Oorgaum Gold Mine. | Oorgaum Gold Mining Company of India. Limited. | Ditto . . | Ditto . . | Origaum . . | Close to mine on the Kolar Gold Field Railway. | Ditto . . | Do. | |
| 8 | Nundydroog Mine . | Nundydroog Company, Limited. | Oorgaum, Bowringpet Taluk, also 6, Queen Street Place, London, E.C. | Oorgaum, Bowringpet Taluk, Kolar Gold Fields. | Ditto . . | Close to mine on the Kolar Gold Field Railway. | Ditto . . | Do. | |

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|---|---|---|---|---|---|---|---|---|---|
| 9 | Tank Mine . . | Mysore West and Mysore Wynaad Consolidated Gold Mining Companies, Limited. | Oorgaum, Bowringpet Taluk, Kolar Gold Fields. | Oorgaum, Bowringpet, Taluk between Nundydroog and Coromandel Blocks. | Oorgaum and Balaghat stations of the Kolar Gold Fields Railways. | ½ mile . . . | Ditto . . | Do. | |
| 10 | Coromandel Mine . | Coromandel Gold Mining Company of India, Limited. | Ditto. Also 6, Queen Street Place, London, E. C. | Kolar Gold Fields, Bowringpet Taluk. | Balaghat on the Kolar Gold Fields Railway. | ¼ „ . . . . | Ditto . . | Do. | |
| 11 | Balaghat Mysore Mine. | Balaghat Mysore Mines, Limited. | Ditto . . | Balaghat, Kolar Gold Fields, Bowringpet Taluk. | Ditto . . | ¼ „ . . . . | Ditto . . | Do. | |
| 12 | The Gold Fields of Mysore | The Gold Fields of Mysore Mining Company, Limited. | Ditto . . | Oorgaum, Bowringpet Taluk on the Kolar Gold Fields. | Ditto . . | Only a short distance from the mine. | Ditto . . | Do. | |
| 13 | Nine Reefs Mine . | Nine Reefs Gold Mining Company, Limited. | Ditto . . | Ditto . . | Ditto . . | 1 mile . . . | Ditto . . | Do. | |
| | | | | *Shimoga District.* | | | | | |
| 14 | Honnali Tribute Syndicate | Honnali Tribute Syndicate. | Managing Agents, Messrs. Wilson & Co., Madras, Kudurakonda, near Nyamti. | Honnali Taluk . . | Birur Station is 56 miles by road from mine, along the road by pony transit and bullock-cart; Harihar Station is 33 miles by road, bullock-cart. | | | Gold. | |
| 15 | No. 15 Honnali . | Honnali Prospecting and Gold Mining Company, Limited. | Kudurakonda, near Kalva Ramganhalli near Nyamti. | Ditto . | Ditto | Ditto | | Do. | |
| 16 | Mysore Nagar Gold Mines. | Mysore Nagar Gold Mining Company. | Honnegudda, near Honnechatti near Benkipur. | Shimoga Taluk . . | ..... | ..... | | Do. | |
| | | | | *Hassan District.* | | | | | |
| 17 | The Kempinkote Gold Field. | The Kempinkote Gold Field, Limited. | Kempinkote . . . | Channarayapatna Taluk. | Tiptur station is 26 miles across country, no proper roads. Arsikere station is 43 miles by road, bullock-carts. French Rocks 50 miles; and 10 miles from Channarayapatna, where there is a travellers' bungalow. Arsikere station is generally the most convenient. | | | Gold. | |
| 18 | Mysore Harnhalli Gold Mine. | Mysore Harnhalli Gold Mining Company. | Harnhalli . . . | Arsikere Taluk . . | Arsikere . . | 3 miles on the road towards Kempinkote, and 1½ miles across the fields. | Bullock-cart, and walking. | Do. . . | This mine has only been prospected a little. |

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of Mine—State, Province, Division, Sub-division or District. | Nearest or most convenient Railway or other Station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | ASSAM. | | | | | |
| | | | | *Naga Hills District.* | | | | | |
| 1 | Dikhu Valley . | Assam Tea Company . | Nazira, Assam . . | Sub-division, Mokokchang. | Dekhu and Sessang Mukhs. | 30 miles . . | Road and river to within 5 miles of mine. | Coal. | |
| | | | | *Lakhimpur District.* | | | | | |
| | Tikak . . . | Assam Railways and Trading Company, Limited. | Tikak . . . | Tikak and Ledo Hills near Margherita Sadr Sub-division. | Dihing Bridge Railway Station at Margherita Colliery line runs to Mines. | Tikak, 6 miles. . | By rail. | Coal. | |
| 2 | Ledo . . . | | Ledo . . . | | | Ledo, 8 miles . . | | | |
| | The "Tirap," "Namdang," and the "Lakadang" coal mines in the hills bearing the same names are not now working, "but the Owners are engaged in laying out works for the purpose." The first two are situated "not very far from the Tikak and Ledo mines." | | | | | | | | |
| | | | | *Khasi and Jaintia Hills District.* | | | | | |
| 1 | Shella . . . | The people of Shella . | Shella . . . . | Shella Khasi Hills . | Chhattak, Sylhet . | About a day's journey. | By boats during rains, by road in winter. | Limestone. | |
| 2 | Dholai Cherra . | Habib Ulla . . | Sylhet . . . . | State Bhowal, Khasi and Jaintia Hills. | Sunamganj, Sylhet . | Ditto . . | Ditto . | Do. | |
| 3 | Patharia . . | | | | | | | | |
| 4 | Bhowal Cherra . | | | | | | | | |
| 5 | Langrin . . | Messrs. Inglis & Co. . | Chhattak, Sylhet . . | State Langrin, Khasi and Jaintia Hills. | Ditto . | Ditto . . | Ditto . | Do. | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | Nongstoin . . | Ditto . | Ditto . . | State Nongstion, Khasi and Jaintia Hills. | Ditto . | Ditto . . | Ditto . | Do. |
| 7 | Borpunji . . | Babu Jeebon Roy . . | Cherrapunji . . . | Borpunji, Khasi and Jaintia Hills. | Thariaghat . . | About 3 miles . | Ditto . | Do. |
| 8 | Sohbar . . . | Messrs. Don, Roy & Co<br>„ Inglis & Co. | Ditto . . .<br>Chhattak, Sylhet . . | Sohharpunji, Khasi and Jaintia Hills. | Ditto . | About 1 mile . | By road . . | Do. |
| | | | | **UPPER BURMA.** | | | | |
| | | | | **NORTHERN DIVISION.** | | | | |
| | | | | *Shwebo District.* | | | | |
| 1 | Letkokbin Colliery . | Burma Coal Company, "Limited." | Kabwet, Shwebo District | Tantabin Sub-division . | Kabwet is the nearest riverine station, and Kinu the nearest railway station. | From Kabwet 4 miles, and from Kinu 8 miles. | From Kinu to Kabwet by horse or cart, thence by Company's steam tramway. The direct route from Mandalay is by the Irrawaddy Flotilla Company's steamers. | Coal. |
| | | | | *Ruby Mines District.* | | | | |
| 1<br>2<br>3<br>4 | Pingntaung Mines .<br>Punma Workings .<br>Tagaungnandaing .<br>Mogôk Shwebоutha Mines. | Burma Ruby Mines Company, "Limited." | Agent to the Burma Ruby Mines Company, Kyatpin. | Mogôk Sub-division . | Thabeikky in riverine station accessible by steamer. | 52 miles . . | By carts, mules, and ponies. | Precious stones, chiefly rubies, spinels, and sapphires. |
| | | | | *Katha District.* | | | | |
| 1 | Chankparat . . | C. M. P. Wright . . | Chankpazat gold mine, Thadaggin, *vid* Namkhan. | Kawlin Sub-division. Mawnaing township, Mawnaing circle. | Namkhan Railway Station. | 11 miles . . | Good cart road in dry season. There are, however, a number of large streams and they have not been bridged; they would be impassible for carts after a heavy shower of rain. | 900 tons of gold quartz are wrought, out of which 80 tons have been crushed. |

## LIST OF MINES IN INDIA—*contd.*

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of Mine—State, Province, Division, Sub-division or District. | Nearest or most convenient Railway or other Station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | **UPPER BURMA—*contd.*** | | | | | |
| | | | | **SOUTHERN DIVISION.** | | | | | |
| | | | | ***Thayetmyo District.*** | | | | | |
| 1 | Tondaung Colliery . | Messrs. W. C. Hulbert and W. R. Lewis. | Tondaung Colliery, Thayetmyo District. | Thayetmyo Sub-division, Thayetmyo township, Minde circle. | No railway station, other station Thayetmyo on river Irrawaddy. | 3½ miles . . | By metalled road . | Coal. | |
| | | | | **TENASSERIM DIVISION.** | | | | | |
| | | | | ***Tavoy District.*** | | | | | |
| 1 | Mount Burney . | Mr. J. D. Watson | Mr. J. D. Watson, Mount Burney. | Mount Burney, central township, Ganktaing circle | No railway, Tavoy . | 3 miles from Tavoy | By carriage . | Gold. | |
| | | | | **MOULMEIN DIVISION.** | | | | | |
| | | | | ***Mergui District.*** | | | | | |
| 1 | Ayer Ganas . . | Telebu Mining and Trading Company, Limited, Maliween. | Maliween . . | Maliween Sub-division, Maliween township, Maliween circle. | No railway . . | 1½ miles . . | By road on foot . | Tin. | |
| 2 | Ditto . . | | | | | | | | |
| 3 | Nan Swai . . | | | | Maliween town . | 5 „ . . . | | | |
| 4 | Klong Grow . . | | | ..... | Victoria Point . | 7 „ . . . | By boat and road . | Do. | |
| 5 | Lo Nuru (Kobong). . | Ditto . | Ditto . . . | Ditto . . . | No railway . . | From 3 to 5 miles . | By road on foot . | Do. | |
| 6 | Lo-Nuru (Klongti-kong Lu Yeon). . | | | | Maliween town . | | | | |

## 17.—LIST OF MINES STARTED DURING THE YEAR 1896, OR MINES THAT WERE NOT WORKING DURING THE PREVIOUS YEAR.

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from Station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | **BURDWAN DIVISION.** | | | | | |
| | | | | **Burdwan District.** | | | | | |
| | | | | *Raniganj.* | | | | | |
| 1 | Mithapur | Loki Nath Nundy | Mithapur | Raniganj Sub-division | Raniganj or Nandy, Assansol. | 4 miles | Horse or palanquin. | Coal. | |
| 2 | Nawadi | Mr. Whyte | Nandy, P. O. Assansol | Ditto | Assansol, E. I. R., Sitarampur. | 4 „ | Ditto | Do. | |
| 3 | Bara Dhemo | Joint Company | Bara Dhemo | Ditto | Sitarampur, E. I. R. | 2 „ | Ditto | Do. | |
| 4 | Raghunathbati | C. Flian, Esq. | Raghunathbati, P. O. Sitarampur, Burdwan. | Ditto | Ditto | 2 „ | Ditto | Do. | |
| 5 | Bara Dhemo | Raghu Nandan Prosad Pronia. | Bara Dhemo, P. O. Sitarampur. | Ditto | Ditto | 1½ „ | Ditto | Do. | |
| 6 | Narsamuda | Sitarampur Coal Company, Mr. Whyte. | Narsamuda, P. O. Assansol, Burdwan. | Ditto | Ondal Railway Station. | 4 „ | Ditto | Do. | |
| 7 | Kadma | Syam Lal Pal | Kodma, P. O. Assansol, Burdwan. | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 8 | West Baraboni | West Baraboni Coal Company. | Raniganj Sub-division | Ditto | Domobani | 1 mile | Ditto | Do. | |
| 9 | Bhas Kajari | Kenaram Barman | Baraboni | Ditto | Ditto | 2 miles | Ditto | Do. | |
| 10 | Joyram Danga | New Birbhum Coal Company. | Joyram Danga | Ditto | Ditto | 2 „ | Ditto | Do. | |
| 11 | Bhanarda | Bonowari Mukherji | Bhanarda, P. O. Charanpur. | Ditto | Domobani Railway Station. | 1 mile | Ditto | Do. | |
| | | | | **Daling District.** | | | | | |
| 1 | Daling Colliery | Private Syndicate | Octavius Steel & Co., 14, Old Court House Street, Calcutta. | Daling Sub-division | Dam Dim, *B. D.* Railway. Siliguri, N. B. Railway. | 12 miles from Dam Dim and 22 miles from Siliguri. | Carts and pack traffic. | Coal. | |

## LIST OF MINES STARTED DURING THE YEAR 1896—*contd.*

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine,—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from Station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | CHOTA NAGPORE DIVISION. | | | | | |
| | | | | HAZARIBAGH DISTRICT. | | | | | |
| 1 | Kanja Latu | Messrs. Atkinson Bros. | Koderma | Giridih Sub-division | Giridih, E. I. R. | 60 miles by *kutcha* road; 90 miles by proper road. | Push-push or palki-bearers. | Mica | Thana Giridih. |
| 2 | Jhorna | E. H. Hetto, Esq. | Dhanwar | Ditto | Ditto | 20 miles | Ditto | Do. | Thana Dhanwar. |
| 3 | Asokoorha | Mr. Looti | Kharakdiha | Ditto | Ditto | Over 20 miles. | Ditto | Do. | Thana Kharakdiha. |
| 4 | Ganoaipur | | | | | | | | |
| 5 | Charkapathal | Ditto | Ditto | Ditto | Ditto | About 20 miles | Ditto | Do. | Do. |
| 6 | Tolo Tand | | | | | | | | |
| 7 | Salbahiar | Kali Prosana Babu | Ditto | Ditto | Ditto | Ditto | Ditto | Do. | Do. |
| 8 | Bacha Kandhey | | | | | | | | |
| 9 | Modhania | Messrs. F. F. Chrestien & Co. | Tisri, Bhurai P. O. | Ditto | Ditto | Ditto | Ditto | Do. | Do. |
| 10 | Khirkhuria | | | | | | | | |
| 11 | Delbia | | | | | | | | |
| 12 | Nazdi | | | | | | | | |
| 13 | Paprua | A. M. Gow. Smith, Esq. | Koderma | Gobindpur Sub-division | Giridih | Koderma is 60 miles by *kutcha* road, 90 miles by proper road. | By palki-bearers or push-push. | Do. | Koderma is 60 miles from Giridih along the very *kutcha* road by which the mica is conveyed to the railway station; but is 90 miles *vid* the Grand Trunk road and Burhee which is the only road fit for any wheeled conveyance. |
| 14 | Saria | | | | | | | | |
| 15 | Haria | | | | | | | | |
| 16 | Shoucta | | | | | | | | |
| 17 | Gambharia | | | | | | | | |
| 18 | Kendua | | | | | | | | |
| 19 | Hadhadua | | | | | | | | |
| 20 | Bhumaria | | | | | | | | |
| 21 | Barumsuta | | | | | | | | |
| 22 | Charua | | | | | | | | |
| 23 | Chulki Bhagi | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 24 | Katharia | Babu Raj Krishna Sahana. | Koderma | Sudder Sub-division | Giridih, E. I. R. | 60 miles by *kutcha* road. | By push-push or palki bearers. | Mica | |
| 25 | Shamsharia | | | | | | | | |
| 26 | Banaria | | | | | | | | |
| 27 | Shakia | | | | | | | | |
| 28 | Haria | | | | | | | | |
| 29 | Basharia | | | | | | | | |
| 30 | Mararia | | | | | | | | |
| 31 | Koshana | | | | | | | | |
| 32 | Kanahia | | | | | | | | |
| 33 | Tooltia | | | | | | | | |
| 34 | Dhowakhad | | | | | | | | |
| 35 | Khamuk Khad | | | | | | | | |
| 36 | Mahmoakhad | | | | | | | | |
| 37 | Mooraria | | | | | | | | |
| 38 | Tandria | | | | | | | | |
| 39 | Kalwa Pahari | Bhagwat Babu | Gawan | Giridih Sub-division | Ditto | Over 40 miles | Ditto | Do. | Thana Gawan. |
| 40 | Madhania | Panchkori Babu | | | | | | | |
| 41 | Dabar | Dr. Saise | | | | | | | |
| 42 | Sava Dhab | Choora Mahto | | | | | | | |
| 43 | Barwadih | Tincouri Babu | | | | | | | |
| 44 | Katkako | Messrs. F. F. Chrestien & Co. | Tisri, Bhurai P. O. | | | | | | |
| 45 | Rajpoora | | | | | | | | |
| 46 | Chirki | | | | | | | | |
| 47 | Ghograh | | | | | | | | |
| 48 | Dhapuhat | | | | | | | | |

## TENASSERIM DIVISION.

### Mergui District.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | Ayer Ganas | Telebu Mining and Trading Company, Limited. | Maliween. | Maliween Sub-division, Maliween Township. | No railway | 1½ miles | By road on foot. | Tin. |
| 2 | Ditto | | | | Maliween Town | 5 „ | | |
| 3 | Nam Swai | | | Maliween Circle | Victoria Point | 7 „ | By boat and road | |
| 4 | Klong Grow | | | | | | | |
| 5 | Lo Nuru (Kabong) | Ditto | Ditto | Ditto | Ditto | From 3 to 5 miles | By road on foot. | Do. |
| 6 | Lo Nuru (Klongti Kong Lu Yeon). | Ditto | Ditto | Ditto | Ditto | | | |

## BOMBAY PRESIDENCY.

### Dharwar District.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | Gold mine | Alnawar Gold Mining Company. | Alnawar Dharwar District. | Alnawar | Alnawar Railway Station. | ⅛ mile | Good road. | Auriferous stone. |

## LIST OF MINES STARTED DURING THE YEAR 1896—*concld.*

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, District or Sub-Division. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BOMBAY PRESIDENCY—*contd.* | | | | | |
| | | | | NELLORE DISTRICT. | | | | | |
| 1 | Three Mica Mines | Palukur Venkatrami Reddysi. | Nellore Taluk | Thatiparti, Atmakur Taluk. | Atmakur | 11 miles | Road | Mica | The Imperial mining rules are now being followed in dealing with applications for prospecting and mining for mica, *vide* Government Order No. 618-R. D., dated 30th November 1896. |
| 2 | Mica Mine | K. Mumiswamy Iyer | Madras | Mangalapur, Gudur Taluk. | Gudur Railway Station. | 6 „ | Donka (a narrow road). | Do. | |
| 3 | Ditto | Ditto | Do. | Chennore | Ditto | 4 „ | Road | Do. | |
| 4 | Ditto | B. Venkata Subba Reddy. | Varagali, Gadur Taluk | Do. | Ditto | 4 „ | Do. | Do. | |
| 5 | Padlakur | K. Venkiah | Nellore | Padlakur | Nellore Railway Station. | 21 „ | Road up to Inukurti and cart-track to the mine. | Do. | |
| 6 | Biradavole Mine | Messrs. Best & Co. | Madras | Biradavole | Ditto | 15 „ | Road to Biradavle and cart-track to the mine. | Do. | |
| 7 | Orupally Mine | E. Pur Narayana Reddy. | E. Pur Gadur Taluk | Arupally Shrotriem | Mamebole Railway Station. | 15 „ | Road to Veerampalli and cart-track to the mine. | Do. | |
| 8 | Chatagottle Mine | P. Venkata Reddy | Boddurem Poolam, Nellore Taluk. | Chotagotla Shrotriem | Nellore Railway Station. | 15 „ | Road to Chatagotla and cart-track to the mine. | Do. | |
| 9 | Mudigoree | K. Subbarami Reddy | Kondapudy, Nellore Taluk. | Mudigooree | Ditto | 21 „ | Road to Inukurti and cart-track to the mine. | Do. | |
| 10 | Toderu Mine | P. Adini Reddy | Toderu | Toderu | Ditto | 13 „ | Road to Toderu and cart-track to the mine. | Do. | |
| 11 | Rachukkela | Ibrahim Saheb & Co. | Gadur | Chaganam | Gudur Railway Station. | 11 „ | Road to Chaganam and cart-track to the mine. | Do. | |
| 12 | Pallamitta Mine | Messrs. Haji Mahomed Badsha Sahab and Company. | Madras | Moolakalapondla | Ditto | 7½ „ | Road to Sydapuram and cart-track to the mine. | Do. | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 13 | Sha Mine | Ditto | Ditto | Sydapuram | Ditto | 9 „ | Ditto | Do. | The Imperial mining rules are now being followed in dealing with applications for prospecting and mining for mica, *vide* Government Order No. 618-R. D., dated 30th November 1896. |
| 14 | Tellapodu | Ansoor Subba Nayudu | Indukurpet, Nellore Taluk | Ditto | Ditto | 9 „ | Ditto | Do. | |
| 15 | Rachukkalubodu | B. Venkata Subba Reddy | Vargali, Gudur Taluk | Chaganam | Ditto | 10 „ | Road to Chaganam and cart-track to the mine. | Do. | |
| 16 | Poturaju Mine | Ditto | Ditto | Turimerla | Ditto | 15 „ | Road to Sydapuram and cart-track to the mine. | Do. | |
| 17 | Vandur Kalana Mine | Ditto | Ditto | Vutikur | Ditto | 12 „ | Ditto | Do. | |
| 18 | C. Mine | Ansoor Subba Nayudu | Indukurpet | Perumallapod | Ditto | 12 „ | Ditto | Do. | |
| 19 | Nandalagunta | Ditto | Ditto | Toorpupoondla | Ditto | 6 „ | Ditto | Do. | |
| 20 | Dundigram Mine | Lakka Kuda Reddy | Tadeparti, Atmakur Taluk. | Dundigram, Kavali Taluk. | Nellore Railway Station. | 25 „ | Road | Do. | |
| 21 | Ditto | L. Annapa Nayudu | Tarunavoya, Nellore Taluk. | Ditto | Ditto | 25 „ | Ditto | Do. | |
| 22 | Ditto | Sheikh Khaja Sahib | Talupurpodu, Atmakur Taluk. | Ditto | Ditto | 25 „ | Ditto | Do. | |
| 23 | Ditto | S. Venkatappa | Srikolam, Atmakur Taluk | Ditto | Ditto | 25 „ | Ditto | Do. | |
| 24 | Ditto | Kotukonda Chinamala Kondaow. | Dundigam | Ditto | Ditto | 25 „ | Ditto | Do. | |
| 25 | Gudladona Mine | M. S. Abdul Wabah Saheb and Company. | Madras | Gudladona | Ditto | 30 „ | Ditto | Do. | |
| 26 | Laxmipuram Garu Jasmany Chimnegani Yessa Chinua Gani. | B. Ranga Reddy | Kavur, Nellore Taluk | Laxmipuram | Ditto | 32 „ | Ditto | Do. | |
| 27 | Chinakraka Mine | Udayagiri Company | Udayagiri | Chinakraka | Ditto | 35 „ | Ditto | Do. | |
| 28 | Tellapodu Mine | Ansoor Subba Nayudu | Indukurpet, Nellore Taluk. | Tellapodu | Ditto | 49 „ | Ditto | Do. | |
| 29 | Kakatur Mine | 1. G. Venkata Suba Reddy.<br>2. K. Yendi Reddy | Ditto | Kukutur Shrotriem | Ditto | 48 „ | Ditto | Do. | |
| 1 | Phosphatic Nodule Mine, Perambalur Taluk, Trichinopoly District. | Messrs. Arbuthnut and Company, Madras, lessees. | Messrs. Arbuthnot & Co., Madras, and lessees of Phospbatic Nodule mines, Uttathur and villages, Perambalur Taluk. | Perambalur Taluk, Trichinopoly District. | Trichinopoly on the South Indian Railway. | 23 „ | Road for 21 miles up to Pudalur and thence cart-track for 2 miles up to Uttathur. | Phosphetic nodules | The grant of a mining lease for 30 years has been sanctioned in Government Order No. 379, dated 30th July 1896. |

## 18.—LIST OF MINES ABANDONED, OR OF WHICH THE WORKING WAS DISCONTINUED DURING THE YEAR 1896.

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine—State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | Remarks. (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2. | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | BENGAL PROVINCE. | | | | | |
| | | | | Burdwan Division. | | | | | |
| | | | | *Burdwan District.* | | | | | |
| 1 | Bhara Dhemo | Dalmal Babu | Baradhemo | Ranigunj Sub-division | Sitarampur, East Indian Railway. | 2 miles | Horse or palanquin. | Coal. | |
| 2 | Chowka | Binod B. Chowdhury | Chowka | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 3 | Sobanpur | Bidhu Sikhar Banerji and others. | Sobanpur | Ditto | Ditto | 4 „ | Ditto | Do. | |
| 4 | Danapahari | Romanath Misser | Danapahari | Ditto | Ditto | 5 „ | Ditto | Do. | |
| 5 | Siriskanali | Kolyanesswari Coal Company. | Siriskanali | Ditto | Ditto | 6 „ | Ditto | Do. | |
| 6 | Harispur | Rameswar Hazra and others. | Kangorakhad, Post Office Ukhra, Village Kajora. | Ditto | Ondal Railway Station. | 4 „ | By foot, horse, or palanquin. | Do. | |
| 7 | Serampur | Oriental Coal Company | Manager, Oriental Coal Company, Giridih. | Giridih Sub-division | Giridih Station, East Indian Railway. | 1½ „ | By push-push or palki-bearers. | Do. | Thana Giridih. |
| 8 | Satighat | Beni Madhub Roy | Satighat Coal Company, Giridih. | Ditto | Ditto | 4 „ | Ditto | Do. | Do. |
| 9 | Ninga | Ram Dutt and Company | Ninga Village, Kalipahari Post Office. | Ranigunj Sub-division | Kalipahari Railway Station, East Indian Railway. | 1 mile | By foot, horse or palanquin. | Do. | |
| 10 | Chooroolia | Turner Morrison and Company. | Chooroolia Post Office | Ditto | Chooroolia Railway Station. | ½ „ | Ditto | Do. | |

## Chota Nagpur Division.

### *Hazaribagh District.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Mutchuna | Babu Chuni Lal Neogy | Gawan | Giridih Sub-division | Giridih, E. I. R. | Over 40 miles | By push-push or palki-bearer. | Mica | Thána Gawan. |
| 2 | Pahary | | | | | | | | |
| 3 | Mouza Dika | | | | | | | | |
| 4 | Clut panki | Babu Behari Lal Gossain | Ditto | Ditto | Ditto | Two miles | Ditto | Ditto | |
| 5 | Sankh | Laljee Mistry | Giridih | Ditto | Ditto | Over 40 miles | Ditto | Ditto | Thána Giridih. |
| 6 | Charka Pathal | | | | | | | | |
| 7 | Newadih | Messrs. F. F. Chrestien & Co. | Tisri, Bhurai P. O. | Ditto | Ditto | | | | Thána Gawan. |
| 8 | Kusmahai | | | | | | | | |
| 9 | Nogoowai | | | | | | | | |
| 10 | Lechmibathan | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. |
| 11 | Katoko | | | | | | | | |
| 12 | Machwa or Madhoa pahary | Tikaetni of Doranda | Doranda | Ditto | Ditto | Ditto | Ditto | Ditto | Thána Dharwar. |
| 13 | Asakurha | Tekait Thakur | Ghoranji | Ditto | Ditto | About 20 miles | Ditto | Ditto | Thána Kharakdiha. |
| 14 | Goonaipur | Narain Singh | | | | | | | |
| 15 | Jhorna | Jowahir Singh | Kharakdiha | | | | | | |

### *Manbhum District.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Khasari | Mr. Whyte | Ranigunj | Gobindpur Sub-division | Nirsha Police Station | 1 mile | Palki | Coal. | |
| 2 | Ditto | Roghunath Bhattacharji | Khasari | Ditto | Ditto | Ditto | Ditto | Ditto. | |
| 3 | Pathoria | Kumar Dakhineswar Malia. | Searsole, Burdwan | Ditto | Ranigunj Ry. Station | 2 miles | Ditto | Ditto. | |

## LIST OF MINES ABANDONED, OR OF WHICH THE WORKING WAS DISCONTINUED DURING THE YEAR 1896.

| No. | Name of mine. | Name of Owner or Company. | Mine address of Owner or Company. | Situation of mine, State, Province, Division, Sub-division or District. | Nearest or most convenient railway or other station. | Distance from station. | Means available for getting to mine from station. | Mineral wrought. | REMARKS (Nearest Thana, etc.) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| | | | BENGAL PROVINCE—*contd.* | | | | | | |
| | | | CHOTA NAGPUR DIVISION—*contd.* | | | | | | |
| | | | *Singhbhum District.* | | | | | | |
| 1 | Somij, Bengal Gold and Silver Mine. | Bengal Gold and Silver Mining Co., Ld. | Somij Gold, Goilkera | Somij Porahat, Bengal | Monohurpur, B.-N. R. Station. | 10 miles | Horse | Gold. | |
| | | | *Sonthal Pargannas.* | | | | | | |
| 1 | Madankota | Ranigunj Coal Association, Ld., Agents, Messrs. Kilburn and Co., Calcutta. | Madankota, Ranigunj Coal Association. | Situated on both sides of the Chord Line, E. I. R., Deoghur Sub-division. | Madhupur or Karmatar, E. I. R. | 10 miles from Madhupur and 6 miles from Karmatar. | Pilot engine, palanquins, bullock carts or riding. A goods train stops when arranged previously. | Coal | This mine was abandoned by the Ranigunj Coal Association as being worked out. |

### BOMBAY PRESIDENCY.

NOTE.—In the returns from this Presidency it is stated that the information regarding quarries has been omitted. This information has been put in the "List of Mines in India."

### RAJPUTANA.

NOTE.—No returns have been received for the so called mines in Rajputana as they are said to be of the nature of quarries to which Mining Rules do not apply, *see* "Special Remarks," Section 21. They have not been included in the "List of Mines in India."

## 19.—NUMBER OF MINES AS SHOWN ON THE "LIST OF MINES IN INDIA."

| | Year 1895. | | Year 1896. | Remarks. |
|---|---|---|---|---|
| 1. Coal, Burdwan District | 83 | mines | 93 | |
| „ Daling „ | ... | | 1 | |
| „ Hazaribagh „ | 8 | mines | 6 | |
| „ Manbhoom „ | 100 | „ | 100 | |
| „ Sonthal Parganas | 4 | „ | 3 | |
| „ Chanda District | 1 | mine | 1 | |
| „ Narsingpur District | 1 | „ | 1 | |
| „ Rewah State | 1 | „ | 1 | |
| „ Jhelum District | 3 | mines | 3 | |
| „ Godavari District | 1 | mine | 1 | |
| „ Naga Hills „ (Assam) | 1 | „ | 1 | |
| „ Lakhimpur „ „ | 2 | mines | 2 | |
| „ Yellandu Hyderabad (Deccan) | 1 | mine | 1 | |
| „ Shwebo District (Upper Burma) | 1 | „ | 1 | |
| „ Thayetmo „ | 1 | „ | 1 | |
| „ Quetta „ (Sor Range Baluchistan) | 5 | mines | 5 | |
| „ „ „ | 2 | „ | 2 | |
| TOTAL | 215 | coal mines. | TOTAL 223 | |
| 2. Mica, Hazaribagh District | 239 | mines | 271 | |
| „ Monghyr „ | 4 | „ | 4 | |
| „ Gya „ | 3 | „ | 3 | |
| „ Nellore „ | 10 | „ | 33 | |
| TOTAL | 256 | mica mines | TOTAL 311 | |
| 3. Stone, Manbhoom District | 7 | mines | 7 | |
| „ Cutch „ | 9 | „ | 9 | |
| „ Kathiawar „ | 7 | „ | These mines did not send returns in 1895. | 7 |
| „ Palunpur State | 2 | „ | Ditto | 2 |
| „ Rewakantha District | 6 | „ | Ditto | 6 |
| „ Mahikantha „ | 9 | „ | 9 | |
| TOTAL | 40 | Stone mines | TOTAL 40 | |
| 4. Gold, Dharwar District | ...? | mine | 1 | |
| „ Ahmednagar District | 1 | „ | 1 | |
| „ Manbhoom „ | ... | „ | 1 | |
| „ Singhbhum „ | 1 | „ | ... | |
| „ Katha „ | 1 | „ | 1 | |
| „ Tavoy „ | 1 | „ | 1 | |
| „ Mysore „ | 1 | „ | 1 | |
| „ Kolar „ | 12 | mines | 12 | |
| „ Shimoga „ | 3 | „ | 3 | |
| „ Hassan „ | 2 | „ | 2 | |
| „ North Arcot „ | ... | mine | 1 | |
| TOTAL | 22 | gold mines | TOTAL 24 | |
| 5. Limestone, Manbhoom District | 2 | mines | 2 | |
| „ Shikarpur Dist. (Bombay) | 24* | „ | 24 | * Quarries were not included in the returns. |
| „ Ahmednagar „ | 1 | mine | 1 | |
| „ Khasi and Jaintia Hills Dist. | 8 | mines | 8 | |
| TOTAL | 35 | Limestone mines | TOTAL 35 | |

| | Year 1895. | | Year 1896. | Remarks. |
|---|---|---|---|---|
| 6. Stone metal, Poona | 9 | mines | 9 | |
| 7. Ghooting, Manbhoom District | 6 | „ | 6 | |
| 8. Slates, Monghyr District | 2 | Slate mines | 2 | |
| „ Panch Mahals | 1 | | 1 | |
| 9. Salt, Punjab | 6 | mines | 6 | |
| 10. Alum Shale, Punjab | 1 | mine | | |
| 11. Iron, Kangra District | 1 | „ | 1 | |
| 12. Fuller's Earth, Hyderabad | 1 | „ | 1 | |
| 13. Clay, Palanpur State | 1 | „ | 1 | |
| 14. Diamonds, Anantpur District (Madras). | 1 | „ | 1 | |
| 15. Precious stones, Ruby Mines Dist. | 4 | mines | 4 | |
| 16. Manganese, Vizagapatam District | 1 | mine | 1 | |
| 17. Tin, Moulmein Division (Burma) | ... | „ | 6 | |
| 18. Phosphatic Nodule Mine (Madras) | ... | „ | 1 | |
| GRAND TOTAL | 581 | | 674+ | |

The above make a total of 581 mines. There appear to be 348 additional mines in Rajputana making a grand total of 929 mines for the year 1895. The principal returns for Rajputana were not received, and this is the reason for their omission from the 1895 lists.

# 20.—YEARLY COMPARATIVE STATEMENT OF MINES IN INDIA.

*Number of mines for each mineral in each Division, District, etc., compiled from the Returns of Form 23. Returns were not received from all mines so that the numbers do not correspond with the "List of Mines in India."*

| Kind of Mine. | 1894. | 1895. | 1896. | Remarks. |
|---|---|---|---|---|
| **Coal Mines.** | | | | |
| Bengal | 171 | 87?(a) | 69 | (a) See Report for year 1895. These figures for the year 1896 do not represent all the mines in India, but only the few for which returns were received. Only a few returns were sent in for the year 1896. |
| Baluchistan | 14 | 12 | 7 | |
| Madras | 1 | 2 | ... | |
| Burma | 1 | 1 | .. | |
| Assam | 4 | 11 | 6 | |
| Central Provinces | 5 | 3 | ... | |
| Punjab | 9 | 3 | ... | |
| Hyderabad (Deccan) | 4 | 4 | 4 | |
| Bombay | 1 | ... | ... | |
| | 200 | 123(b) | 86 | (b) See Report for year 1895. |
| **Mica Mines.** | | | | |
| Bengal | 56 | 60 | 70 | |
| Madras | 10 | 12 | ... | |
| | 66 | 72(c) | 70 | (c) See Report for year 1895. |
| **Salt Mines.** | | | | |
| Punjab | 2 | 5 | ... | |
| Kashmir | 1 | ... | ... | |
| | 3 | 5 | ... | |
| **Fireclay and Clay Mines.** | | | | |
| Bengal | 2 | ... | 1 | |
| Central Provinces. (This is not a separate mine, but a coal mine where fireclay is a subsidiary mineral) | 1 | 1 | ... | |
| Rajputana (Sufed miti—white clay) | ... | 1 | .. | |
| | 3 | 2 | 1 | |
| **Limestones and Slabs Mines.** | | | | |
| Bengal | 4 | ... | 6 | |
| Bombay (British States) | 24 | 1 | ... | |
| Do. (Native States) | 11 | ... | ... | |
| Rajputana | ... | 43 | ... | |
| | 39 | 44 | 6 | |

| Kind of Mine. | 1894. | 1895. | 1896. | Remarks. |
|---|---|---|---|---|
| **Stone Mines.** | | | | |
| Bombay (Native States) | 46 | 4 | ... | |
| Rajputana | ... | 1 | ... | |
| | 46 | 5 | .. | |
| **Sandstone Mines.** | | | | |
| Rajputana | ... | 201 | ... | |
| Ditto | ... | 8(*a*) | ... | (*a*) Red. |
| Ditto | ... | 1(*b*) | ... | (*b*) Yellowish. |
| | ... | 210 | ... | |
| **Sandstone or Marble.** | | | | |
| Rajputana | ... | 3(*c*) | ... | (*c*) Yellowish. |
| | ... | 3 | ... | |
| **Slate Mines.** | | | | |
| Bengal | 2 | ... | ... | |
| Bombay (British States) | 7 | ... | ... | |
| | 9 | ... | ... | |
| **Plumbago Mine.** | | | | |
| Travancore | 1 | 1(*d*) | ... | (*d*) Mine only worked for three months in the year. |
| | 1 | 1 | ... | |
| **Manganese Mine.** | | | | |
| Madras | 1 | 1 | ... | |
| | 1 | 1 | ... | |
| **Gold Mines.** | | | | |
| Bengal | 1 | ... | ... | |
| Hyderabad (Deccan) | 4 | ... | ... | |
| Madras | 1 | 1 | ... | |
| Mysore | 17 | 18 | ... | |
| Burma | ... | 1 | ... | |
| | 23 | 20 | ... | |
| **Ruby Mines.** | | | | |
| Upper Burma | 1 | 1 | ... | |
| | 1 | 1 | ... | |
| **Sapphire Mines.** | | | | |
| Upper Burma | 9 | 1 | ... | |
| | 9 | 1 | ... | |

# 21.—SPECIAL MATTERS OR STATEMENTS FROM RETURNS RECEIVED FOR 1896.

*Summary of the returns of mines started and stopped, in continuation of the returns of Form 26 for 1894 and 1895.*

| No. | Names of Districts, etc. | Particulars. | Remarks. |
|---|---|---|---|
| 1 | Bengal Province, Bhagalpur, Chota Nagpur and Burdwan Divisions. | A list was received of mines started and abandoned in these Divisions. | Other divisions than those in which "mines started and abandoned are given", are blank. |
| 2 | North-Western Provinces and Oudh. | No mines working in these provinces at present. | |
| ... | Mirzapur District . . . | "Coal mines were opened in this district in 1896, and work commenced in March but soon stopped. There were no accidents during the time the mines were at work." | The number of mines "opened" was not given. |
| 3 | Central Provinces . . . | No coal mines were started or abandoned during the half year ending the 31st December. | No returns were received for the first half-year. |
| 4 | Punjab . . . . . | No new mines were started, or any mines abandoned during the second half-year, 1896. | Ditto. |
| 5 | Rajputana . . . . | The First Assistant to the Agent to the Governor General in Rajputana says, in his letter No. 524-C., dated 31st January 1897, that the so-called mines are of the nature of quarries to which the Mining Rules do not appear to be applicable. | Quarries are included in the definition of "Mine" given in the "Draft Mines Act" for India, therefore, if this definition is adopted, the "Mining Rules" will apply to quarries. |
| 6 | Hyderabad Assigned Districts . | No mines were at work in these districts during 1896. | |
| 7 | Bombay Presidency . . | Information regarding quarries was omitted in the returns. | No reference was made to any mines having been started or abandoned. *See* remark to No. 5. |
| 8 | Madras Presidency . . | No mines were started or any mines abandoned during the half-year ending 30th June 1896. | Some mica mines were started during the second-half year. *See* Section on "mines started during 1896." |
| 9 | Travancore . . . . | No new mines were started, or any mines abandoned during the half-year ending 31st December 1896. | No returns were received for the first-half of the year. |
| 10 | Burma . . . . . | No mines were started or any mines abandoned during the year 1896. | |
| 11 | Assam . . . . . | Ditto ditto. | |

# 22.—MINES, MINERALS AND EMPLOYÉS.

*Particulars collected from the returns of Form 23.*

NOTE.—Returns were not received for all the mines in India.

| PLACE AND MINERAL. | No. of mines. | WEIGHT WROUGHT IN TONS. Dressed. | WEIGHT WROUGHT IN TONS. Undressed. | NUMBERS OF PERSONS EMPLOYED AT EACH KIND OF MINE. Above ground. Males. | Above ground. Females. | Total above ground. | Below ground. Males. | Below ground. Females. | Total below ground. | Total above and below ground. | REMARKS. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BENGAL PROVINCE.** | | | | | | | | | | | |
| **CHOTA NAGPUR DIVISION.** | | | | | | | | | | | |
| **COAL MINES.** | | | **MANBHUM DISTRICT.** | | | | | | | | |
| Manbhum District, including Gobindpur Sub-Division | 37 | Tons. 431,068 | Tons. ... | 2,300 | 1,229 | 3,529 | 3,145 | 1,331 | 4,476 | 8,005 | |
| | 32 | ... | 798,917 | 4,817 | 4,503 | 9,320 | 5,844 | 3,438 | 9,282 | 18,602 | |
| | 69 | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| TOTAL DRESSED AND UNDRESSED | | Tons. 1,229,985 | | 7,117 | 5,732 | 12,849 | 8,989 | 4,769 | 13,758 | 26,607 | |
| **BALUCHISTAN.** | | | | | | | | | | | |
| Frontier Kalat and Bolan Districts | 5 | Tons. 23,318 | ... | 116 | ... | 116 | 479 | ... | 479 | 595 | |
| | 1 | *Dressed and undressed* | | | | | | | | | |
| | 1 | Tons. 259 *Coal and dust.* | | 27 | ... | 27 | 8 | ... | 8 | 35 | |
| | | Tons. 2,680 | | 15 | 5 | 20 | 30 | ... | 30 | 50 | |
| TOTAL DRESSED AND UNDRESSED, ETC. | | Tons. 26,257 | | 158 | 5 | 163 | 517 | ... | 517 | 680 | |
| **HYDERABAD (DECCAN).** | | | | | | | | | | | |
| Singareni Colliery, Yellandu | 4 | *Whether dressed or undressed was not stated.* Tons. cwt. qrs. 262,680 19 3. | | 998 | 252 | 1,250 | 3,843 | 739 | 4,582 | 5,832 | |
| **ASSAM.** | | | | | | | | | | | |
| Lakhimpur and Naga Hills | 6 | ... | Tons. cwts. 177,259 6 | 348 | 201 | 549 | 616 | 265 | 881 | 1,430 | |
| **COAL MINES IN INDIA FOR WHICH RETURNS WERE RECEIVED.** | | | | | | | | | | | |
| Bengal Province | 69 | Tons. 431,068 | Tons. 798,917 | 7,117 | 5,732 | 12,849 | 8,989 | 4,769 | 13,758 | 26,607 | |
| Baluchistan | 7 | Tons. 23,318 *Dressed and undressed.* Tons. 259 *Coal and dust.* Tons. 2,680 | | 158 | 5 | 163 | 517 | ... | 517 | 680 | |
| Hyderabad (Deccan) | 4 | *Whether dressed or undressed was not stated.* Tons. cwt. qrs. 262,680 19 3. | | 998 | 252 | 1,250 | 3,843 | 739 | 4,582 | 5,832 | |
| Assam | 6 | ... | Tons. cwt. qrs. 177,259 6 2 | 348 | 201 | 549 | 616 | 265 | 881 | 1,430 | |
| TOTAL COAL | 86 | Tons. 454,386 *Dressed* Tons. cwt. qrs. 976,176 6 2 *undressed.* Tons. 259 *Dressed and undressed.* Tons. 2680 *Coal and dust.* Tons. cwt. qrs. 262,680 19 3. *Whether dressed or undressed was not stated.* | | 8,621 | 6,190 | 14,811 | 13,965 | 5,773 | 19,738 | 34,549 | |
| **MICA.** | | | **BENGAL PROVINCE.** | | | | | | | | |
| | | | **CHOTA NAGPUR DIVISION.** | | | | | | | | |
| Chota Nagpur Division | 70 | Maunds. 2,000 | Maunds. 5,030 | 406<br>1,028 | 696<br>1,044 | 1,102<br>2,072 | 806<br>1,093 | 482<br>32 | 1,288<br>1,125 | 2,390<br>3,197 | |
| TOTAL MICA | 70 | *Dressed* 2,000 *Undressed* 5,030 | | 1,434 | 1,740 | 3,174 | 1,899 | 514 | 2,413 | 5,587 | |
| | | | **CHOTA NAGPUR DIVISION.** | | | | | | | | |
| | | **GHOOTING.** | **MANBHUM DISTRICT.** | | | | | | | | |
| Gobindpur Sub-Division | 6 | ... | Tons 1,334 | 27 | 18 | 45 | 41 | 40 | 81 | 126 | |
| | | Clay (Khari mati.) | | | | | | | | | |
| Ditto. | 1 | Weight not given. | | 20 | 30 | 50 | ... | ... | ... | 50 | |

## 23.—NUMBER OF MINES AT WORK IN DECEMBER 1896, AVERAGE NUMBER OF PERSONS EMPLOYED DAILY, AND WEIGHT OF SALEABLE MINERALS WROUGHT DURING THE YEAR 1896.

| 1 | 2 | 3 | 4 | 5 | 6 | | | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Situation of mine—State, Province, Division or District. | Names or descriptions of minerals wrought. | Number of mines at which each mineral was being worked during December. | State or condition of the minerals as named or described whether dressed or undressed, etc. | Weight wrought of minerals as named or described. | Number of persons employed at each kind of mine. | | | | | | Remarks. |
| | | | | | Below ground. | | Total below ground. | Above ground. | | Total above ground. | Total below and above ground. | |
| | | | | | Males. | Females. | | Males. | Females. | | | |
| | | | | BENGAL PROVINCE. | | | | | | | | |
| | | | | CHOTA NAGPUR DIVISION. | | | | | | | | |
| | | | | *Manbhum District.* | | | | | | | | |
| | | | | Tons. | | | | | | | | |
| Manbhum District | Coal | 5 | Dressed | 139,887 | 1,301 | 356 | 1,657 | 935 | 437 | 1,372 | 3,029 | |
| | Do | 7 | Undressed | 527,108 | 3,408 | 2,152 | 5,560 | 1,529 | 1,097 | 2,626 | 8,186 | |
| Gobindpur Sub-Division, District Manbhum. | Do. | 32 | Dressed | 291,181 | 1,844 | 975 | 2,819 | 1,365 | 792 | 2,157 | 4,976 | |
| | Do. | 25 | Undressed | 271,809 | 2,436 | 1,286 | 3,722 | 3,288 | 3,406 | 6,694 | 10,416 | |
| | | 37 | Dressed | 431,068 | 3,145 | 1,331 | 4,476 | 2,300 | 1,229 | 3,529 | 8,005 | |
| | | 32 | Undressed | 798,917 | 5,844 | 3,438 | 9,282 | 4,817 | 4,503 | 9,326 | 18,602 | |
| | TOTAL | 69 | | 1,229,085 | 8,989 | 4,769 | 13,758 | 7,117 | 5,732 | 12,849 | 26,607 | |
| | | | | BALUCHISTAN. | | | | | | | | |
| | | | | Tons. | | | | | | | | |
| Sind-Peshin State Railway, Frontier District, Baluchistan— | | | | | | | | | | | | |
| (1) Khost | Coal | 4 | Dressed | 16,998 | 258 | ... | 258 | 95 | ... | 95 | 353 | |
| (2) Shahrig | Do. | ... | ..... | 6,261 | 211 | ... | 211 | 19 | .. | 19 | 230 | |
| Kalat District— | | | | | | | | | | | | |
| Singali | Do. | 1 | Coal and dust | 2,680 | 30 | ... | 30 | 15 | 5 | 20 | 50 | |
| Bolan District— | | | | | | | | | | | | |
| Less | Do. | 1 | Dressed and undressed. | 259 | 8 | ... | 8 | 27 | ... | 27 | 35 | |
| Dagari Lase | Do. | 1 | Dressed | 59 | 10 | ... | 10 | 2 | ... | 2 | 12 | |
| | | 7 | Total "dressed" | 23,318 | 479 | ... | 479 | 116 | ... | 116 | 595 | |
| | | | Total "dressed and undressed." | 259 | 8 | ... | 8 | 27 | ... | 27 | 35 | |
| | | | Total "coal and dust." | 2,680 | 30 | ... | 30 | 15 | 5 | 20 | 50 | |
| | | | | 28,257 | 517 | ... | 517 | 158 | 5 | 163 | 680 | |

## NUMBER OF MINES AT WORK IN DECEMBER 1896, AVERAGE NUMBER OF PERSONS EMPLOYED DAILY, AND WEIGHT OF SALEABLE MINERALS WROUGHT DURING THE YEAR 1896—*contd.*

| 1 | 2 | 3 | 4 | 5 | 6 | | | | | | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Number of persons employed at each kind of mine. | | | | | | |
| Situation of mine—State, Province, Division or District. | Names or descriptions of minerals wrought. | Number of mines at which each mineral was being worked during December. | State or condition of the minerals as named or described whether dressed or undressed, etc. | Weight wrought of minerals as named or described. | Below ground. | | Total below ground. | Above ground. | | Total above ground. | Total below and above ground. | Remarks. |
| | | | | | Males. | Females. | | Males. | Females. | | | |
| | | | BENGAL PROVINCE—*contd.* | | | | | | | | | |
| | | | HYDERABAD (DECCAN). | | | | | | | | | |
| Yellandu— | | 4 mines— | | | | | | | | | | |
| Hyderabad State (Deccan) Terminus of 16—miles, Branch Railway from Dornakal on the N. G. S. Railway. | Coal<br>King Seam | No. 1 Incline, Nos. 13, and 14, and 15 Pits.<br>..... | Unscreened and screened coal (mainly)—<br>Singareni coal unscreened.<br>Steam coal screened<br>Nut coal Do.<br>Slack coal Do. | Annual out put for year 1896<br>Tons cwt. qrs.<br>262,680 19 3 | 3,843 | 739 | 4,582 | 998 | 252 | 1,250 | 5,832 | |
| | | | Whether dressed or undressed was not stated. | Tons cwt. qrs.<br>262,680 19 3 | 3,843 | 739 | 4,582 | 998 | 252 | 1,250 | 5,832 | |
| | | | ASSAM. | | | | | | | | | |
| Lakhmipur | Coal | Four | Undressed | Tons.<br>176,436 | 616 | 265 | 881 | 292 | 201 | 493 | 1,374 | |
| Naga Hills | Do. | Two | Do. | Tons. Cwt.<br>823—6¼ | ... | ... | ... | 56 | ... | 56 | 56 | |
| | TOTAL | | | Tons. cwt. qrs.<br>177,259 6 2 | 616 | 265 | 881 | 348 | 201 | 549 | 1,431 | |

## BENGAL PROVINCE.

### Chota Nagpur Division.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mds. | | | | | | | | |
| Chota Nagpur Division. | Mica . . | 39 | Dressed . . | 2,000 | 806 | 482 | 1,288 | 406 | 696 | 1,102 | 2,390 |
| | Do. . . | 31 | Undressed . | 5,030 | 1,093 | 32 | 1,125 | 1,028 | 1,044 | 2,072 | 3,197 |
| | Total . | 70 | | 7,030 | 1,899 | 514 | 2,413 | 1,434 | 1,740 | 3,174 | 5,587 |

### Chota Nagpur Division.

*Manbhum District.*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Tons. | | | | | | | |
| Gobindpur Sub-Division, District Manbhum. | Ghooting . | 6 | Undressed .. . | 1,334 | 41 | 40 | 81 | 27 | 18 | 45 | 126 |
| Ditto ditto . | Clay (khari mati). | 1 | Do. . . | (not stated). | 20 | 30 | 50 | ... | ... | ... | 50 |

# 24.—QUANTITY, IN TONS, OF COAL PRODUCED IN INDIA DURING THE LAST SEVENTEEN YEARS.

(From the Administration Report on the Railways in India for 1896-97, etc.)

| Years. | Provinces. | | | | | | | | | | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bengal. | Punjab. | Central Provinces. | Assam. | Central India. | Nizam's Territory. | Madras. | Baluchistan. | Burma. | North-Western Provinces and Oudh. | |
| | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. | Tons. |
| 1880—1886* | 7,726,491 | ... | 663,380 | 131,059 | 23,337 | ... | ... | ... | ... | ... | 8,544,267 |
| 1887 | 1,319,090 | 7,523 | 128,981 | 89,302 | 15,497 | 3,259 | ... | 411 | ... | ... | 1,564,063 |
| 1888 | 1,380,594 | 11,249 | 157,768 | 101,528 | 41,580 | 13,382 | ... | 2,802 | ... | ... | 1,708,903 |
| 1889 | 1,541,356 | 22,835 | 144,465 | 116,676 | 52,956 | 59,646 | ... | 8,238 | ... | ... | 1,946,172 |
| 1890 | 1,626,245 | 40,677 | 137,022 | 145,708 | 77,842 | 125,486 | ... | 15,541 | ... | ... | 2,168,521 |
| 1891 | 1,747,122 | 60,714 | 141,736 | 154,208 | 69,741 | 144,668 | 20 | 10,368 | ... | ... | 2,328,577 |
| 1892 | 1,920,050 | 66,352 | 132,005 | 164,050 | 88,623 | 149,601 | 61 | 13,284 | 3,670 | ... | 2,537,696 |
| 1893 | 1,870,720 | 77,294 | 135,118 | 164,420 | 94,348 | 157,421 | 502 | 20,094 | 9,938 | ... | 2,529,855 |
| 1894 | 2,035,934 | 66,467 | 140,495 | 169,448 | 132,837 | 240,525 | 1,337 | 21,498 | 12,111 | ... | 2,820,652 |
| 1895 | 2,345,761 | 72,493 | 122,776 | 172,717 | 118,479 | 292,915 | 1,737 | 23,259 | 17,289 | .. | 3,167,426 |
| 1895† | 3,550,069 | 72,493 | 122,776 | 172,717 | 118,479 | 292,915 | 1,737 | 23,259 | 17,289 | ... | 4,371,734 |
| 1896 | 3,028,925 | 79,017 | 141,185 | 177,259 | 115,386 | 262,681 | ... | 10,572 | 22,993 | 1,000 | 3,839,018 |
| | The following are the figures sent in the returns to my office.—J. G. | | | | | | | | | | |
| 1894 | 2,495,098 | 66,467 | 273,331 | 170,298 | Included with Central Provinces. | 240,525 | 1,337 | 24,753 | 12,368 | ... | 3,284,177 |
| 1895 | 1,679,586 | 66,470 | 241,283 | 173,155 | Ditto | 292,914 | 1,737 | 25,458 | 17,290 | ... | 2,497,893 |
| 1896 | A sufficient number of returns were not received to enable the output to be given. | | | | | | | | | | |

* The figures for the years 1880 to 1886 were given in previous reports.
† The figures for 1895 have been revised since last year.

## 25.—RETURNS OF THE NUMBER OF PERSONS EMPLOYED FOR EACH MINERAL, EXCLUDING THOSE FOR RAJPUTANA, 1896.

| Mineral. | Above ground. | | Below ground. | | Total above ground. | Total below ground. | Total above and below ground. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | Males. | Females. | Males. | Females. | | | | |
| Coal . . . . . | 8,621 | 6,190 | 13,965 | 5,773 | 14,811 | 19,738 | 34,549 | These four minerals are all for which returns were received. |
| Mica . . . . . | 1,434 | 1,740 | 1,899 | 514 | 3,174 | 2,413 | 5,587 | |
| Ghooting (limestone) . . . | 27 | 18 | 40 | 41 | 45 | 81 | 126 | |
| Clay . . . . . | 20 | 30 | ... | ... | 50 | ... | 50 | |
| Total . | 10,102 | 7,978 | 15,904 | 6,328 | 18,080 | 22,232 | 40,312 | |

Note.—No returns were received from Rajputana.

# 26.—NUMBER OF PERSONS KILLED BY MINING ACCIDENTS IN INDIA DURING THE YEAR 1896.

Deaths. | Place of accident.
District. | Cause of accident.
Kind of mine. | Remarks.

| No. | State, Province, Division, District, or Sub-Division. | Mineral. | Falls in Mine. | | | | In and at Shafts. | | | | | | | | Miscellaneous below ground. | | | | | | | | | On Surface. | | | | | GROSS TOTALS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fall of roof, stone or coal. | Fall of sides. | Fall of coal from working faces. | Total falls in mine. | Overwinding. | Ropes and chains breaking. | Whilst ascending or descending by machinery. | Falling into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in and at shafts. | Explosions of fire damp. | Suffocation by gases. | By explosives. | Irruptions of water and falling into water. | On inclined and engine planes. | By trams or tubs, but not on inclined and engine planes. | By machinery. | By other causes. | Total miscellaneous below ground. | Total below ground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | Total on surface. | |
| | **Bengal.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Burdwan Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Burdwan District, Raniganj Sub-Division. | Coal | 1 | ... | ... | 1 | ... | ... | 2 | .. | ... | ... | 1 | ... | 3 | ... | ... | 2 | ... | ... | ... | ... | ... | 2 | 6 | ... | ... | ... | ... | ... | 6 | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Hazaribagh District, Giridih Sub-Division. | ,, | 4 | ... | ... | 4 | ... | ... | 1 | 1 | ... | ... | ... | ... | 2 | 1 | .. | ... | ... | ... | 1 | ... | 1 | 3 | 9 | ... | ... | ... | ... | ... | 9 | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Manbhum District, Gobindpur Sub-Division. | ,, | ... | ... | 2 | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 | ... | ... | ... | ... | 7 | 9 | ... | ... | 1 | 1 | 2 | 11 | |
| | **Central Provinces.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Chanda District.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Warora | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns were received from these places. |
| | *Rewah State.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Umaria | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | **Punjab.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Jhelum District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | **Baluchistan.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Baluchistan District | ,, | 1 | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... | ... | ... | 3 | The return of form 24 was very meagrely and incorrectly filled in. |
| | **Hyderabad (Deccan).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Yellandu, Singareni | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 1 | ... | ... | 5 | ... | ... | 6 | 7 | ... | ... | ... | 1 | 1 | 8 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BURMA (UPPER). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Central Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Shwebo District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns received from here. |
| | ASSAM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Ledo Valley and Tikak | ,, | 4 | ... | ... | 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | 3 | 1 | ... | ... | 6 | 10 | ... | ... | 4 | 1 | 5 | 15 | |
| | COAL MINES TOTALS | | 10 | ... | 2 | 12 | ... | ... | 3 | 2 | ... | ... | 1 | 1 | 7 | 3 | 1 | 3 | 7 | 3 | 7 | ... | 1 | 25 | 44 | ... | ... | 5 | 3 | 8 | 52 | |
| | MADRAS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | North Arcot District | Gold | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns were received from these places. |
| | MYSORE STATE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Hassan District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 13 | Kolar District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | GOLD MINES TOTALS | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | BENGAL. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Hazaribagh District, Giridih Sub-Division. | Mica | 2 | 11 | ... | 13 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 13 | ... | ... | ... | 1 | 1 | 14 | | |
| | *Patna Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Gya District, Nawada Sub-Division. | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns received from here. | |
| | MICA MINES TOTALS | | 2 | 11 | ... | 13 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 13 | ... | ... | ... | 1 | 1 | 14 | | |
| | PUNJAB. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | Jhelum District | Salt | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 17 | Bannu District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | SALT MINES TOTALS | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | RAJPUTANA. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18 | Ulwar State | Stone. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns were received from these places. |
| | BURMA. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Northern Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 | Ruby Mines District | Rubies, sapphires and spinels. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | GROSS TOTALS | | 12 | 11 | 2 | 25 | ... | ... | 3 | 2 | ... | ... | 1 | 1 | 7 | 3 | 1 | 3 | 7 | 3 | 7 | ... | 1 | 25 | 57 | ... | ... | 5 | 4 | 9 | 66 | |

Form 25. India.

## 27.—NUMBER OF PERSONS SERIOUSLY INJURED BY MINING ACCIDENTS IN INDIA DURING 1896.

Seriously injured. | Place of accident.
District. | Cause of accident.
Kind of mine. | Remarks.

| No. | State, Province, Division, District, or Sub-division. | Mineral. | Falls in mine. | | | | In and at shafts. | | | | | | | | | Miscellaneous below ground. | | | | | | | | | | On Surface. | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fall of roof, stone, or coal. | Fall of sides. | Fall of coal from working faces. | Total falls in mine. | Overwinding. | Ropes and chains breaking. | Whilst ascending or descending by machinery. | Falling into shaft from surface. | Falling from part way down. | Things falling from surface. | Things falling from part way down. | Miscellaneous. | Total in and at shafts. | Explosions of fire-damp. | Suffocation by gases. | By explosives. | Irruptions of water and falling into water. | On inclined and engine planes. | By trams or tubs, but not on inclined and engine planes. | By machinery. | By other causes. | Total miscellaneous below ground. | Total below ground. | By machinery. | Boilers and steam pipes bursting. | On railways and tramways belonging to mine. | Miscellaneous. | Total on surface. | GROSS TOTALS. | |
| | **Bengal.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Burdwan Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Burdwan District, Raniganj Sub-division. | Coal | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 1 | 1 | ... | ... | ... | 1 | 1 | 2 | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Hazaribagh District, Giridih Sub-division. | ,, | 7 | 1 | ... | 8 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | 3 | ... | 2 | 5 | 14 | 3 | ... | ... | 5 | 8 | 22 | |
| 3 | Manbhum District, Gobindpur Sub-division. | ,, | 2 | 2 | ... | 4 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | 1 | 1 | 2 | 7 | |
| | **Central Provinces.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Chanda District, Warora | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns were received from these places. |
| 5 | Rewah State, Umaria | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 6 | Narsinghpur District, Mohpani. | ,, | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | **Punjab.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Jhelum District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BALUCHISTAN. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Baluchistan District | ,, | 2 | 1 | ... | 3 | ... | ... | 2 | 2 | 1 | ... | ... | ... | 5 | 3 | ... | ... | ... | ... | ... | ... | ... | 3 | 11 | ... | ... | ... | ... | ... | 11 | The returns of form 24 was very meagrely and incorrectly filled in. |
| | HYDERABAD (Deccan). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Yellandu, Singareni | ,, | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 4 | ... | 1 | 7 | 8 | 1 | ... | ... | ... | 1 | 9 | |
| | BURMA (Upper). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Central Division, Shwebo District. | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns received. |
| | COAL MINES TOTALS | | 12 | 4 | ... | 16 | ... | ... | 2 | 2 | 1 | ... | ... | 2 | 7 | 3 | ... | 2 | ... | ... | 8 | ... | 3 | 16 | 39 | 4 | ... | 1 | 7 | 12 | 51 | |
| | MYSORE STATE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | Hassan District | Gold | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 12 | Kolar District | ,, | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns received. |
| | GOLD MINES TOTALS | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | BENGAL. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | *Chota Nagpur Division.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Hazaribagh District, Giridih Sub-division. | Mica | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | No returns received. |
| | PUNJAB. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Jhelum District | Salt | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| | GROSS TOTALS | ... | 12 | 4 | ... | 16 | ... | ... | 2 | 2 | 1 | ... | ... | 2 | 7 | 3 | ... | 2 | ... | ... | 8 | ... | 3 | 16 | 39 | 4 | ... | 1 | 7 | 12 | 51 | |

## 28—SUMMARY OF ACCIDENTS DURING 1896. India.

*Number of males and females killed and seriously injured, classified as to causes.*

| No. | Causes of accidents in terms of "Form 25," and whether above or below ground. | Deaths. | | Serious Accidents. | | Total deaths. | Total seriously injured. | |
|---|---|---|---|---|---|---|---|---|
| | | Males. | Females. | Males. | Females. | | | |
| | **I.—Falls in Mine.** | | | | | | | |
| 1 | Fall of roof, stone, or coal | 7 | 5 | 11 | 1 | 12 | 12 | |
| 2 | Fall of sides | 11 | ... | 4 | ... | 11 | 4 | |
| 3 | Fall of coal from working faces | 2 | ... | ... | ... | 2 | ... | |
| | TOTALS FROM FALLS IN MINE | 20 | 5 | 15 | 1 | 25 | 16 | Falls in mine. |
| | **II.—In and at Shafts.** | | | | | | | |
| 1 | Overwinding | ... | ... | ... | ... | ... | ... | |
| 2 | Ropes and chains breaking | ... | ... | ... | ... | ... | ... | |
| 3 | Whilst ascending or descending by machinery | ... | 1 | 2 | ... | 1 | 2 | |
| 4 | Falling into shaft from surface | 4 | ... | 2 | ... | 4 | 2 | |
| 5 | Falling from part way down | ... | ... | 1 | ... | ... | 1 | |
| 6 | Things falling from surface | ... | ... | ... | ... | ... | ... | |
| 7 | Things falling from part way down | 1 | ... | ... | ... | 1 | ... | |
| 8 | Miscellaneous | ... | ... | 2 | ... | ... | 2 | |
| | TOTALS IN AND AT SHAFTS | 5 | 1 | 7 | ... | 6 | 7 | In and at shafts. |
| | **III.—Miscellaneous Below Ground.** | | | | | | | |
| 1 | Explosions of fire-damp | 3 | ... | 3 | ... | 3 | 3 | |
| 2 | Suffocation by gases | 1 | ... | ... | ... | 1 | ... | |
| 3 | By explosives | 3 | ... | 2 | ... | 3 | 2 | |
| 4 | Irruptions of water and falling into water | 7 | ... | ... | ... | 7 | ... | |
| 5 | On inclined and engine planes | 2 | 1 | ... | ... | 3 | ... | |
| 6 | By trams or tubs | 5 | 2 | 4 | 4 | 7 | 8 | |
| 7 | By machinery | ... | ... | ... | ... | ... | ... | |
| 8 | By other causes | 2 | ... | 3 | ... | 2 | 3 | |
| | TOTALS MISCELLANEOUS BELOW GROUND | 23 | 3 | 12 | 4 | 26 | 16 | Miscellaneous below ground. |
| | TOTALS BELOW GROUND | 48 | 9 | 34 | 5 | 57 | 39 | Totals below ground. |
| | **IV.—On surface.** | | | | | | | |
| 1 | By machinery | ... | ... | 4 | ... | ... | 4 | |
| 2 | Boilers and steam pipes bursting | ... | ... | ... | ... | ... | ... | |
| 3 | On railways and tramways belonging to mine | 5 | ... | 1 | ... | 5 | 1 | |
| 4 | Miscellaneous | 4 | ... | 7 | ... | 4 | 7 | |
| | TOTALS ON SURFACE | 9 | ... | 12 | ... | 9 | 12 | Totals on surface. |
| | GROSS TOTALS ABOVE AND BELOW GROUND | 57 | 9 | 46 | 5 | 66 | 51 | Gross totals. |
| | | Males. | Females. | Males. | Females. | Males and Females. | Males and Females. | |

## 29.—Accidental deaths in each district for each mineral.

*Deaths caused by accidents at Mines in India during the year 1896, classified for districts and for minerals.*

| No. | Districts, etc. | Description of mine. | Below ground. | | Above ground. | | Total deaths. | Gross total of deaths for each kind of mine. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Males deaths. | Females deaths. | Males deaths. | Females deaths. | | | |
| | BENGAL. | | | | | | | | Returns of accidents were not received for those districts left blank. |
| | *Burdwan Division.* | | | | | | | | |
| 1 | Burdwan District, Raniganj Sub-division | Coal | 5 | 1 | ... | ... | 6 | | |
| | *Chota Nagpur Division.* | | | | | | | | |
| 2 | Hazaribagh District, Giridih Sub-division | „ | 5 | 4 | ... | ... | 9 | | |
| 3 | Manbhum District Gobindpur Sub-division. | „ | 9 | ... | 2 | ... | 11 | | |
| | CENTRAL PROVINCES. | | | | | | | | |
| | *Chanda District.* | | | | | | | | |
| 4 | (Warora Colliery) | „ | ... | ... | ... | ... | ... | | |
| | *Rewah State.* | | | | | | | | |
| 5 | (Umaria) | „ | ... | ... | ... | ... | ... | | |
| | PUNJAB. | | | | | | | | |
| 6 | Jhelum District | „ | ... | ... | ... | ... | ... | | |
| | BALUCHISTAN. | | | | | | | | |
| 7 | Baluchistan District | „ | 3 | ... | ... | ... | 3 | | |
| | HYDERABAD (DECCAN). | | | | | | | | |
| 8 | Yellandu (Singareni) | „ | 5 | 2 | 1 | ... | 8 | | |
| | BURMA (UPPER). | | | | | | | | |
| 9 | Central Division | „ | ... | ... | ... | ... | ... | | |
| | ASSAM. | | | | | | | | |
| 10 | Ledo Valley and Tikak | „ | 8 | 2 | 5 | ... | 15 | | |
| | | | | | | | Coal | 52 | |
| | MADRAS. | | | | | | | | |
| 11 | North Arcot District | Gold | ... | ... | ... | .. | ... | | |
| | MYSORE STATE. | | | | | | | | |
| 12 | Hassan District | „ | ... | ... | ... | ... | ... | | |
| 13 | Kolar District | „ | ... | ... | ... | ... | ... | | |
| | | | | | | | Gold | ... | |
| | BENGAL. | | | | | | | | |
| | *Chota Nagpur Division.* | | | | | | | | |
| 14 | Hazaribagh District, Giridih Sub-division | Mica | 13 | ... | 1 | ... | 14 | | |
| | *Patna Division.* | | | | | | | | |
| 15 | Gya District, Nawada Sub-division | „ | ... | ... | ... | ... | ... | | |
| | | | | | | | Mica | 14 | |
| | PUNJAB. | | | | | | | | |
| 16 | Jhelum District | Salt | ... | ... | ... | ... | ... | | |
| 17 | Bannu District | „ | ... | ... | ... | ... | ... | | |
| | | | | | | | Salt | ... | |

*Deaths caused by accidents at mines in India during the year 1896*—contd.

| No. | Districts, etc. | Description of mine. | Below ground. | | Above ground. | | Total deaths. | Gross total of deaths for each kind of mine. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Males deaths. | Females deaths. | Males deaths. | Females deaths. | | | |
| | RAJPUTANA. | | | | | | | | Returns of accidents were not received for those districts left bank. |
| 18 | Ulwar State . . | Stone . | ... | ... | ... | ... | ... | | |
| | | | | | | | Stone | ... | |
| | BURMA (UPPER.) *Northern Division.* | | | | | | | | |
| 19 | Ruby Mines District . | Rubies, sapphires and spinels | ... | ... | ... | ... | ... | ... | |
| | | | | | | | Rubies, sapphires and spinels. | ... | |
| | | | ... | ... | ... | ... | | | |
| | | | 57 | | 9 | | ... | 66 | |

## 30.—Non-fatal Accidents in each district for each mineral.

*Serious accidents (non-fatal) at Mines in India, during the year 1896.*

| No. | Districts, etc. | Description of mine. | Below ground. | | Above ground. | | Total non-fatal accidents. | Gross total non-fatal accidents for each kind of mine. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Males non-fatal accidents. | Females non-fatal accidents. | Males non-fatal accidents. | Females non-fatal accidents. | | | |
| | BENGAL. | | | | | | | | Returns of accidents were not received for those districts left blank. |
| | *Burdwan Division.* | | | | | | | | |
| 1 | Burdwan District, Raniganj Sub-division . | Coal . | ... | ... | ... | ... | ... | | |
| | *Chota Nagpur Division.* | | | | | | | | |
| 2 | Hazaribagh District, Giridih Sub-division . | „ . | 12 | 2 | 8 | ... | 22 | . . | |
| 3 | Manbhum District. Gobindpur Sub-division. | „ . | 5 | 1 | 3 | ... | 9 | | |
| | CENTRAL PROVINCES. | | | | | | | | |
| | *Chanda District.* | | | | | | | | |
| 4 | (Warora) . . . | „ . | ... | ... | ... | ... | ... | | |
| | *Rewah State.* | | | | | | | | |
| 5 | (Umaria) . . . | „ . | ... | ... | ... | ... | ... | | |
| 6 | Narsinghpur District, (Mohpani) . . . | „ . | ... | ... | ... | ... | ... | | |
| | PUNJAB. | | | | | | | | |
| 7 | Jhelum District . . | „ . | ... | ... | ... | ... | ... | | |
| | BALUCHISTAN. | | | | | | | | |
| 8 | Baluchistan District . | „ . | 11 | ... | ... | ... | 11 | | |
| | HYDERABAD (DECCAN). | | | | | | | | |
| 9 | Yellandu (Singareni) . | „ . | 6 | 2 | 1 | ... | 9 | | |
| | BURMA (UPPER). | | | | | | | | |
| | *Central Division.* | | | | | | | | |
| 10 | Shwebo . . . | „ . | ... | ... | ... | ... | ... | | |
| | | | | | | | Coal . | 51 | |
| | MYSORE STATE. | | | | | | | | |
| 11 | Hassan District . . | Gold . | ... | ... | ... | ... | ... | | |
| 12 | Kolar District . . | „ . | ... | ... | ... | ... | ... | | |
| | | | | | | | Gold . | .... | |
| | BENGAL. | | | | | | | | |
| | *Chota Nagpur Division.* | | | | | | | | |
| 13 | Hazaribagh District, Gobindpur Sub-division. | Mica . | ... | ... | ... | ... | ... | | |
| | | | | | | | Mica . | ... | |
| | PUNJAB. | | | | | | | | |
| 14 | Jhelum District . . | Salt . | ... | ... | ... | ... | ... | | |
| | | | | | | | Salt . | ... | |
| | | | 34 | 5 | 12 | ... | | | |
| | | | 39 | | 12 | | ... | 51 | |

# 31.—Occupations of persons killed and injured during the years 1894, 1895, and 1896.

| No. | Occupations. | 1894. | | | | 1895. | | | | 1896. | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Below ground. | | Above ground. | | Below ground. | | Above ground. | | Below ground. | | Above ground. | | |
| | | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | |
| 1 | Superintendent | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 2 | Mining Assistant | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 3 | Foreman | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | |
| 4 | Petty Contractor | 1 | ... | .. | 1 | ... | ... | ... | ... | ... | ... | ... | ... | |
| 5 | Sardar | ... | 1 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | |
| 6 | Mates | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 7 | Maistris | ... | ... | ... | 1 | 1 | 2 | ... | 1 | ... | ... | ... | ... | |
| 8 | Jamadars | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | |
| 9 | Miners, Hewers, and Coal-cutters. | 66 | 59 | ... | ... | 39 | 36 | ... | 1 | 26 | 20 | 2 | 2 | |
| 10 | Coal-carriers | 3 | 1 | ... | ... | ... | 3 | ... | ... | 3 | 2 | ... | ... | |
| 11 | Fillers | 1 | 1 | ... | 1 | 1 | 2 | ... | ... | 2 | ... | ... | ... | |
| 12 | Trammers and Shunting Coolies. | 2 | 3 | 3 | 1 | 1 | 7 | 1 | 1 | 3 | 1 | ... | ... | |
| 13 | Drillers and Drillers' Coolies. | 2 | 1 | ... | ... | 1 | 4 | ... | ... | ... | ... | ... | ... | |
| 14 | Sinkers | ... | ... | ... | ... | ... | 1 | ... | ... | 4 | ... | ... | ... | |
| 15 | Blasters | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | |
| 16 | Stone-cutters | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | |
| 17 | Carpenters | 1 | 3 | ... | ... | ... | 3 | ... | ... | ... | 1 | ... | ... | |
| 18 | Timbermen | ... | 1 | ... | ... | 2 | 9 | ... | ... | ... | ... | ... | ... | |
| 19 | Khalasies | 2 | ... | ... | 1 | 1 | 1 | ... | 3 | 1 | ... | ... | 1 | |
| 20 | Enginemen and Firemen. | ... | ... | ... | 1 | 1 | ... | ... | 3 | ... | ... | ... | 1 | |
| 21 | Train or Loco. Drivers. | ... | ... | 1 | 2 | ... | ... | ... | 2 | ... | ... | ... | ... | |
| 22 | Brakesmen | 1 | ... | ... | ... | ... | ... | .. | ... | ... | ... | 1 | 1 | |
| 23 | Landers | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | |
| 24 | Feeders | ... | ... | ... | ... | ... | ... | ... | 2 | ... | .. | ... | ... | |
| 25 | Platelayers, platelaying makadams and coolies and linemen. | 1 | 3 | ... | ... | 2 | ... | 1 | ... | 2 | ... | .... | *1 | * Trollyman. |
| 26 | Ropemen | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 27 | Pump and Air-pipe Fitters. | ... | ... | ... | .. | 2 | 2 | 1 | ... | 2 | 1 | ... | 1 | |
| 28 | Pump-boys | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 29 | Bucketmen | ... | ... | ... | ... | ... | 3 | ... | 1 | ... | ... | ... | ... | |
| 30 | Oil boys and assay boys. | ... | 1 | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | |
| 31 | Screeners | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | |
| 32 | Dustwomen | ... | 2 | ... | ... | ... | 2 | ... | ... | 1 | 1 | ... | ... | |
| 33 | Coolies or Labourers | 14 | 37 | 4 | 18 | 33 | 59 | ... | 10 | 10 | 8 | 4 | 2 | |
| 34 | Wheelers | ... | ... | ... | ... | ... | 7 | ... | ... | ... | ... | ... | ... | |
| 35 | Tub-boys | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |

*Occupations of persons killed and injured during the years 1894, 1895, and 1896*—contd.

| No. | Occupations. | 1894. | | | | 1895. | | | | 1896. | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Below ground. | | Above ground. | | Below ground. | | Above ground. | | Below ground. | | Above ground. | | |
| | | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | Number killed. | Number injured. | |
| 36 | Wading Coolies . | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 37 | Watchmen . . | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 38 | Daily . . . | 1 | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | |
| 39 | Unknown and not employed at the mines. | 15 | 8 | 4 | ... | 5 | 9 | 4 | 4 | | ... | 1 | ... | |
| 40 | Hooker on . . | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 2 | ... | ... | |
| 41 | Munshi . . . | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | |
| 42 | Door-keeper . . | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | |
| 43 | Carter . . . | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| 44 | Syce . . . | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | |
| 45 | Blacksmith . . | ... | ... | ... | ... | ... | ... | .. | ... | ... | ... | ... | 1 | |

## 32.—PARTICULARS OF GOVERNMENT AND RAILWAY COMPANIES' MINES FOR THE YEAR 1896, COPIED FROM THE "RAILWAY ADMINISTRATION REPORT FOR 1896-97."

### KURHURBAREE AND SERAMPORE COLLIERIES.

These collieries are worked in connection with the East Indian Railway, and the entire supply of fuel for that Railway is drawn from them.

The pits and inclines of which the collieries consist, and the general depths reached at the end of the year 1896, are given below:

### KURHURBAREE.

| | Feet. |
|---|---|
| 2. "Jubilee" pit. Winding coal | 650 |
| 23D. Downcast, pumping and drawing coal | 429 |
| 17B. Downcast, drawing coal | 295 |
| 40. Worked out | 204 |
| 23. Upcast | 106 |
| 2C. Upcast, winding coal | 156 |
| 2D. Downcast | 132 |
| 7. Jogitand. Upcast, pumping and winding coal | 275 |
| 1. Jogitand. Upcast, winding coal | 178 |
| 5. Jogitand. Downcast | 125 |
| Bitagarha. Upcast, winding coal | 252 |
| Sariabad. Downcast, winding coal | 231 |
| 23E. Sunk to lower seam | 200 |
| 17A. Incline. Downcast, hauling coal | 60 |
| 17. Incline worked out | 200 |
| 23B. Shaft. Upcast, hauling coal | 320 |
| 23D. Incline. Downcast, hauling coal | 80 |
| Bhalmoritand. Downcast, winding coal | 244 |
| Joktiabad. In course of sinking | 150 |

### SERAMPORE.

| | Feet. |
|---|---|
| 16A. Downcast, pumping and drawing coal | 344 |
| 21A. Upcast, drawing coal | 279 |
| 18. Upcast | 100 |
| 25. Downcast, pumping and drawing coal | 199 |
| 42D. Downcast, drawing coal | 83 |
| 42A. Worked out | 155 |
| Helta pit. Auxiliary to 1 Kamaljore | 168 |
| 1. Kamaljore. Downcast, drawing coal | 176 |
| 2. Kamaljore. Upcast, drawing coal | 176 |
| Central pit commenced to drive out | 486 |

The following table shows the output and number of persons employed during 1896, as compared with the previous year:—

| Year. | Average number of persons employed daily. | Output. | | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|---|
| | | Large coal.* | Small coal. | Slack coal. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. | Tons. |
| Previous year | 5,291† | 344,172 | 45,120 | 53,056 | 442,348 | 84* |
| 1896 | 5,853 | 393,964 | 34,570 | 45,290 | 473,824 | 81 |

* All coal which will not pass through a $\frac{3}{4}$" mesh is classed as large coal.

† Revised figures.

From the slack, 18,945 tons of coke were manufactured.

At the "Jubilee" pit, a boiler chimney, a pair of direct acting winding engines, and a 50-feet pit head framing have been erected, and are now at work, shaft has been unwatered and 280 feet of gallery driven, 3,000 feet remaining to be driven to connect with the Sariabad mines.

Galleries have been commenced at the "Central" pit at Serampore. The seam at this mine is $23\frac{1}{2}$ feet in thickness and of good quality throughout.

At the "Bhalmoritand" pit at Kurhurbaree, coal was struck at 235 feet. The thickness of the coal (lower seam) is 9 feet.

The connection line between Serampore and Kurhurbaree has been completed and is a great convenience in every respect.

There are twenty-two ponies working under ground.

The fire at Serampore has been kept under control.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| | | | | | | | Tons. | Tons. | Tons. | Tons. |
| Previous year . | 3 | 9 | 3 | 9 | 1,764* | 1,764* | 147,116* | 147,116* | 114,724 | 114,724 |
| 1896 . . | 4 | 23 | 4 | 23 | 1,464 | 1,464 | 118,456 | 118,456 | 98,491 | 98,491 |

* Revised figures.

## Makum Collieries—

The Assam Railways and Trading Company now work three collieries, *viz.*, Ledo valley (with 2 mines), Upper Ledo and Tikak, and arrangements are being made to open out another colliery with 2 mines at Namdang. The output of coal during 1896 was 176,436 tons against 172,661 tons in the previous year. It is largely used by ocean and inland steamers, railways, mills and factories, the demand being far in excess of the present outturn.

## Warora Colliery—

This colliery, which is worked by Government, has the following seven shafts of depths and uses as under :—

| | Feet. | |
|---|---|---|
| Pit No. 1 . . . . | 245 | . . . Pumping. |
| „ 2 . . . . | 215 | . . . Winding. |
| „ 3 . . . . | 239 | . . . Pumping. |
| „ 4 . . . . | 181 | . . . Winding. |
| „ 5 . . . . | 174 | . . . „ |
| „ 6 . . . . | 102 | . . . Ventilating. |
| „ 9 (new) . . . | 170 | . . . „ |

The following table shows the output and number of persons employed during 1896 as compared with the previous year :—

| Year. | Average number of persons employed daily. | Output. | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|
| | | Large coal.† | Small coal. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. |
| Previous year . . | 883 | 84,643 | 16,740 | 101,383 | 11 |
| 1896 . . . . | 779 | 99,462 | 22,181 | 121,643 | 156 |

† All coal which will not pass through a $\frac{3}{4}$" mesh is classed as large coal.

During the year 2,497½ tons of fire-clay were raised for manufacture of bricks and tiles.

There was no very serious outbreak of fire in the mines.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| | | | | | | | Tons. | Tons. | Tons. | Tons. |
| Previous year . | 1 | 6* | 1 | 6 | 883 | 883 | 101,383 | 101,383 | 84,643 | 84,643 |
| 1896 . . . | 3 | 5* | 3 | 5 | 260 | 260 | 40,548 | 40,548 | 33,154 | 33,154 |

* Excluding slight accidents.

The fatal accidents during the year were caused by falls of roof and side coal and by the breaking off of the iron rope from the bucket worked in the pump and consequent falling of the iron wires.

## Mohpáni Colliery—

This colliery is worked by the Nerbudda Coal and Iron Company, Limited.

The several shafts and other entrances in use are as under :—

| | Depth. Feet. |
|---|---|
| Helen pit.—Main pumping shaft . . . . . | 400 |
| No. 1 Staple.—South river workings, fan shaft. . . | 170 |
| No. 2 Drift.—South river workings, hauling incline slope . | 275 |
| No. 3 Drift.—South river workings, hauling incline slope . | 150 |
| No. 3 Drift.—Old fire workings, hauling incline slope, self-acting . . . . . | 165 |
| Gothic drift and staple.—Furnace shaft . . . . . | 30 |
| No. 24 Sinking.—New field . . . . . | 123 |
| No. 34 trial staple.—New field, coal is at 80 feet . . | 34 |
| No. 38 trial staple.—New field, coal is at 72 feet . . | 53½ |

The following table shows the output and number of persons employed during 1896 as compared with the previous year :—

| Yea . | Average number of persons employed daily. | Output. | Number of tons raised per person employed. |
|---|---|---|---|
| | | Tons. | Tons. |
| Previous year . . . . . | 719 | 21,393 | 30 |
| 1896 . . . . . | 653 | 19,542 | 30 |

The No. 24 shaft sinking was deepened from 81 feet to 123 feet and 12 feet into No. 2 seam. Some further proving of No. 1 seam was effected.

A deep fault was met with in No. 24 shaft, No. 1 seam winnings and borings were put down to prove it.

The working out of the old mines, which lie mostly under the river, has now for three years been suspended during the rainy season. The

strata have been kept strong enough by working on the packing up system to prevent all in-rushes of water, but the conditions are not good enough to allow risking active working during the rains.

The Mohpani Branch of the Great Indian Peninsula Railway was extended during the year to the new coal-fields.

The follow ng table shows the total number of accidents that have occurred during the last two years and the number killed and injured, compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per detah. |
| | | | | | | | Tons. | Tons. | Tons. | Tons. |
| Previous year . . . | ... | 23 | ... | 23 | ... | ... | ... | ... | ... | ... |
| 1896 . . . . . | 1 | 15 | 2 | 15 | 653 | 326 | 19,542 | 9,771 | 19,542 | 9,771 |

## Umaria Colliery—

This colliery which is worked by Government consists of pits and inclines. The general depth reached at the end of the year were :—

| | Feet. |
|---|---|
| Pit No. 1.—Shaft for water-supply to the station (steam power) . . | 123 |
| Pit No. 2.—Upcast, ventilating shaft, also pumping shaft . . . | 131 |
| Pit No. 3.—Downcast, drawing coal . . . . . | 117 |
| Pit No. 4.—Downcast, pumping shaft . . . . . | 236 |
| Pit No. 5.—Upcast, pumping shaft . . . . . | 192 |
| Pit No. 6.—Downcast, drawing coal . . . . . | 93 |
| Pit No. 7.—Upcast in course of sinking . . . . . | 145 |
| Pit No. 8.—Downcast in course of sinking . . . . . | 60 |
| Incline No 1.—Travelling road for workmen . . . . . | 181 |
| Incline No. 2.—Haulage road for coal . . . . . | 216 |
| Incline No. 3.—Travelling road for workmen and for ventilation . . | 216 |
| Incline No 4.—Haulage road for coal . . . . . | 281 |
| Incline No. 5.—Haulage road for coal . . . . . | 143 |
| Incline No. 6.—Travelling road for workmen and for ventilation (in course of driving). | 90 |

The following table shows the output and number of persons employed during 1896 as compared with the previous year :—

| Year. | Average number of persons employed daily. | Large coal.* | Small coal. | Total. | Number of tons raised per person employed. |
|---|---|---|---|---|---|
| | | Tons. | Tons. | Tons. | Tons |
| Previous year . . . | 1,208 | 86,951 | 31,555 | 118,506 | 98 |
| 1896 . . . . | 1,707 | 77,792 | 37,594 | 115,386 | 68 |

* All coal which will not pass through a $\frac{3}{4}$" mesh is classed as large coal.

The decrease of 3,120 tons in the total output was due to the abandonment of broken work reserved for final operation.

There was an outbreak of cholera in the month of February 1896, which disorganised labour and interfered with the successful raising of coal.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| Previous year . . . . | 3 | 19 | 3 | 19 | 403 | 403 | 39,502 | 39,502 | 28,983 | 28,983 |
| 1896 . . . . . | 1 | 9 | 1 | 9 | 1,707 | 1,707 | 115,386 | 115,386 | 77,792 | 77,792 |

## Coal-fields at Telanpali near the Eeb river—

In the last report it was stated that work on the trial shaft in connection with the Bengal Nagpur Railway at Kadobahal near the Eeb river was stopped at 65 feet. No further experiments were made. An estimate, amounting to ₹6,600, for coal boring was sanctioned by Government against which no expenditure has as yet been incurred. A diamond drill boring is to be made.

## Singareni Colliery—

This colliery is worked by the Hyderabad (Deccan) Company, Limited.

The Colliery consists of —

| | Depth. Feet. |
|---|---|
| No. 1 Incline . . . . . | 400 |
| No. 6 Pit . . . . . | 400 |
| No. 13 Pit . . . . . | 187 |
| No. 14 Pit . . . . . | 181 |
| No. 15 Pit . . . . . | 150 |
| "Batten Pit" . . . . . | 395 |

The following table shows the output and number of persons employed during 1896 as compared with the previous year :—

| Year. | Average number of persons employed daily. | Output. | | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|---|
| | | Large coal. * | Nut coal. | Slack and dust. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. | Tons. |
| Previous year . . | 4,434 | 210,898 | 55,654 | 26,362 | 292,914 | 66 |
| 1896 . . . . | 5,832 | ... | ... | ... | 262,681 | 45 |

* All coal which will not pass through a $\frac{3}{4}$" mesh is classed as large coal.

The output in 1896 was 30,233 tons less than in 1895 owing to breaches on the Nizam's Guaranteed State Railway, which prevented coal being despatched and on account of commercial restrictions; but the slight retrogression has had no relationship to the producing capabilities of the collieries, which have been considerably increased.

Arrangements have now been made with the Great Indian Peninsula and Nizam's Guaranteed State Railway Companies, which enables Singareni coal to compete in the Bombay market; 84,650 tons have already been sold there: this ensures a ready market for a very much larger output than has hitherto been obtained.

The underground workings of the collieries, which are entirely prosecuted in the "King" seam of coal, have been largely extended during the year, and exploration headings have been pushed well in advance of the general body of faces. In all the special headings, coal of the very best quality has been proved, and this has been especially patent in those driven towards the "deep" of the coal-field.

During the year, provision has been made for considerably increasing the output of the collieries, and to this end the "Batten" pit has been located and sunk further to the deep of the coal-field. This shaft is 15 feet diameter in the clear and is 395 feet in depth to the foot of the "King" seam, which at this point has proved of good thickness and excellent quality. The mine has been equipped to raise 1,200 tons daily, and from its position commands large areas of coal. It is anticipated that this pit will shortly be contributing a large proportion of the general output of the collieries.

To the north-west of the present group of mines, the No. 6 pit has also been sunk to the "King" seam at a depth of 400 feet from the surface. The coal is of good quality and winning-out headings are being driven as rapidly as possible to open out and develop the workings.

The ventilation of the colliery is established by the employment of a 12-feet-diameter Schiele fan, which is driven by one of a duplicate pair of high pressure engines.

This fan is capable of ventilating more than double the present working area.

Much has been effected in the way of improvements for the welfare of the workpeople: houses of an improved type are being erected, and arrangements have been made to secure an abundance of good water and good wholesome food, so that it is probable there will be little difficulty in setting ample labour on the field for all requirements.

The demand for Singareni coal has of late so much increased that further development of the colliery is necessary, and it has been decided to commence sinking one, if not more additional pits at once.

The following table shows the number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| | | | | | | | Tons. | Tons. | Tons. | Tons. |
| Previous year . . . | 5 | 6 | 5 | 6 | 887 | 887 | 58,583 | 58,583 | 42,180 | 42,180 |
| 1896 . . . . . | 8 | 9 | 8 | 9 | 729 | 729 | 32,835 | 32,835 | ... | ... |

## Dandot Colliery.—

This colliery is worked in connection with the North-Western State Railway.

The following table shows the output and number of persons employed during 1896 as compared with the previous year:—

| Year. | Average number of persons employed daily. | Output. | | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|---|
| | | Large coal. * | Small coal. | Slack. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. | Tons. |
| Previous year . . | 1,906 | 46,171 | 3,389 | 16,795 | 66,355 | 35 |
| 1896 . . . . | 2,063 | 49,896 | 2,508 | 22,617 | 75,021 | 36 |

* All coal which will not pass through a $\frac{3}{8}$" mesh is classed as large coal.

There is only one coal seam and it lies at an elevation of about 2,000 feet above sea level in the Salt Range.

The seam varies in thickness from 1′ 6″ to 5 feet, the average being about 2′ 9″.

The strata in which the seam lies consist of soft friable clay shales which, owing to their rapid disintegration on exposure to air, make the maintenance of the mine somewhat costly and troublesome.

The coal is worked by means of level or inclined tunnels driven into the hill sides, and is at present being extracted at three mines namely :—

South or outcrop mines.
Main mine.
Pidh mines.

The coal is taken from the various mines to the Dandot Station on the North-Western State Railway by means of steam tramways and inclines with a gauge of 2 feet.

The Pidh mines are not directly connected with the tramways, the coal being at present carried about one mile from the mines to the tramway by pack animals.

The supply of labour continues to be a difficulty at the colliery during the hot season of the year, many of the miners, who are landowners, go away to attend to their field work.

No exploration for coal of any magnitude was undertaken during the year.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the average number of men employed daily:—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| Previous year . | 1 | 24 | 1 | 24 | 1,906 | 1,906 | 66,355 | 66,355 | 46,171 | 46,171 |
| 1896 . . . | 2 | 22 | 2 | 22 | 1,031 | 1,031 | 37,511 | 37,511 | 24,948 | 24,948 |

## Bhaghanwala Colliery.—

This colliery is worked in connection with the North Western State Railway.

The following table shows the output and number of persons employed during 1896 as compared with the previous year:—

| Year. | Average number of persons employed daily. | Output. | | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|---|
| | | Large coal.* | Small coal. | Slack. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. | Tons. |
| Previous year . . . . . | 944 | 3,178 | 266 | 2,693 | 6,137 | 7 |
| 1896 . . . . . | 680 | ,143 | 329 | 1,521 | 3,993 | 6 |

* All coal which will not pass through a $\frac{3}{8}$" mesh is classed as steam coal.

The decrease of 2,144 tons in the total output was due to the stoppage of some mines until the opening of the tramway was opened.

The colliery is situated in the Salt Range about 1,800 feet above sea level, and about 20 miles east of the Dandot Colliery.

There is only one coal seam, which is of an average thickness of about 4 feet.

The seam lies in parts nearly level, and in parts is tilted up at an angle of 45° from the horizontal.

It is worked solely by horizontal tunnels driven into the side of the hill.

The coal is of a very friable nature and liable to spontaneous combustion.

The coal is sent down from the mines by means of steam tramways and a self-acting incline with a gauge of 2' 6" to the Bhaghanwala station, North Western State Railway.

The exploratory work, which has been undertaken by means of drifts and boreholes, has up to date been of a somewhat disappointing nature.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| Previous year . | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | ... |
| 1896 . . . | ... | 8 | ... | 8 | ... | ... | ... | ... | ... | ... |

## Khost Colliery—

This colliery is worked in connection with the North Western State Railway.

The colliery at present consists of main-ways and adits; of these all are now practically worked out except Nos. 3, 4, 12 and Takrai, dips on which work is going on.

| | Feet. |
|---|---|
| Progress on adit No. 4 . . . . . | 1,383 |
| Ditto No. 12 . . . . | 280 |
| Ditto Takrai Dip Mainway West . . | 406 |
| Ditto ditto East . . | 325 |

The following table shows the output and number of persons employed during 1896 as compared with the previous year :—

| Year. | Average number of persons employed daily. | Output. | | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|---|
| | | Large coal. * | Nut coal. | Unscreened small and dust. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. | Tons. |
| Previous year . . . . . | 352 | 9,327 | 791 | 6,880 | 6,998 | 48 |
| 1896 . . . . . | 427 | 5,491 | 719 | 2,957 | 9,167 | 22 |

* All coal that will not pass through a ½" mesh is classed as large coal.

The decrease of 7,831 tons in the total output was chiefly due to the small demand made by the Locomotive department for large coal and to there being no large customers for dust coal. Most of the mines were closed in August on account of lessened demand for coal.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the average number of men employed daily :—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Total number of persons killed. | Total number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| Previous year . | 1 | 6 | 1 | 9 | 352 | 352 | 16,998 | 16,998 | 9,327 | 9,327 |
| 1896 . . . | 1 | 6 | 1 | 8 | 427 | 427 | 9,167 | 9,167 | 5,491 | 5,491 |

## Shahrigh Colliery—

This colliery, which is worked in connection with the North Western State Railway, has the following five mainways:—

| | Feet. |
|---|---|
| No. 1 Adit mainway, west | 553 |
| No. 3 Adit mainway, east | 1,035 |
| No. 5 Adit mainway, west | 1,167 |
| No. 6 Adit mainway, east | 573 |
| No. 6 Adit mainway, west | 649 |

The following table shows the output and number of persons employed during 1896 as compared with the previous year:—

| Year. | Average number of persons employed daily. | Output. | | | | Number of tons raised per person employed. |
|---|---|---|---|---|---|---|
| | | Large coal.* | Nut coal. | Small and dust. | Total. | |
| | | Tons. | Tons. | Tons. | Tons. | Tons. |
| Previous year | 230 | 3,148 | 180 | 2,933 | 6,261 | 27 |
| 1896 | 212 | 1,026 | 72 | 307 | 1,405 | 7 |

* All coal which will not pass through a $\frac{3}{4}$" mesh is classed as large coal.

The decrease of 4,856 tons in the total output was chiefly due to the absence of demand from the Locomotive Department, as also to the mines being closed at the end of May 1896 to enable that department to use up the large stock of fuel on hand.

The following table shows the total number of accidents that have occurred during the last two years, and the number killed and injured, compared with the output and the averge number of men employed daily:—

| Year. | Total number of fatal accidents. | Total number of other accidents. | Number of persons killed. | Number of persons injured. | Average number of persons employed daily. | | Number of tons of coal raised of all kinds. | | Number of tons of large coal raised. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Per fatal accident. | Per death. | Per fatal accident. | Per death. | Per fatal accident. | Per death. |
| Previous year | 2 | 2 | 2 | 3 | 115 | 115 | 3,131 | 3,131 | 1,574 | 1,574 |
| 1896 | 2 | 3 | 2 | 3 | 106 | 106 | 703 | 703 | 513 | 513 |

## Coal Mines near Mach—

Little work has been done during the past year in the mines near Mach on the Mushkaf-Bolán line of railway, but, now that this line is about to be opened, it is probable that the local mining interest will turn their attention to the opening up of mines within this area.

## Baluchistan Coal Mines—

The chief areas within which, during the past year, coal-mining operations have been carried on, are those included in the Khost and Sharigh mines, the Sor Range mines, and the mines near Mach in the Bolán.

There are five owners of mines who, under concessions, carry on operations in the Sor Range district.

The octroi receipts for coal passing into the station of Quetta show that about 100,000 maunds have paid dues this year. Of this coal three-fourths of it is sold to the Commissariat Department in the form of coal or patent fuel for use in the barracks at a cost of R22-8-0 per ton.

No accident of importance has been reported during the year, but it is known that some portions of the Sor Range mines have taken fire and been left to burn themselves out.

## Letkonbin Colliery—

This colliery is worked by the Burma Coal Company, Limited.

The following table shows the output during 1896 as compared with the previous year :—

| Year. | Output. | | |
|---|---|---|---|
| | Steam coal. | Dust. | Total. |
| | Tons. | Tons. | Tons. |
| Previous year | 13,759 | 3,531 | 17,290 |
| 1896 | 16,435 | 6,549 | 22,984 |

The output has been comparatively small owing to certain water difficulties, which were due to the seam being worked by inclines from the outcrop, where bad roof with heavy percolation was met with, drowning out the workings. To provide against further percolation in future, a vertical shaft is being sunk through 300 feet of firm sandstone.

The following is a result of an analysis of the coal :—

| | |
|---|---|
| Fixed carbon | 55·71 |
| Volatile matter | 26·70 |
| Ash | 3·48 |
| Moisture | 14·11 |

The moisture is somewhat heavy, but this is proved to decrease at a lower depth, and the percentage of carbon and volatile matter to increase proportionately.

The coal so far supplied has, however, not always been put to this standard, this being due to its having been mostly outcrop coal. When the new deep shaft is in working order, round coal of superior quality only will be supplied; all small and dust will then be carefully extracted and manufactured into briquettes.

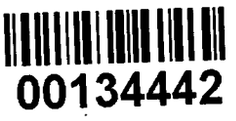
Experiments are now being made to utilize the dust (which has so far been treated as refuse, there being only a small sale for it in Rangoon for brick-burning) for briquette manufacture.

A briquette machine has been erected, and the experiments with the briquettes produced have proved thoroughly satisfactory in the Company's locomotives and boilers.

The Burma railway, after preliminary trials of some twelve tons of these briquettes, ordered a trial lot of 300 tons, and these are now being experimented with.

It is anticipated that, with the increased output from the new vertical shaft, now being sunk, and the sale of briquettes made of dust coal which has been hitherto practically a waste product, the revenue of the colliery will be considerably increased, and that the cost of production per ton will also be reduced.

The Burma railway, after special trials of this coal, offered Rs. 10-4-0 per ton for a lot of 100 tons mined at a greater depth than that from which the coal was previously obtained.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